GEBWELL

Installation, Commissioning and Maintenance manual

Aries ground source heat pump

WWW.GEBWELL.COM

Contents

KEEP THE OPERATION INSTRUCTIONS IN THE IMMEDIATE VICINITY OF THE DEVICE!

Read the instructions carefully before installing, adjusting or servicing the device. Always follow the instructions. Ask the installation technician to complete the installation log. The manufacturer's warranty is only valid with an installation log.

Fill in the details below. If there are failures with the device, these details must be available.

Ground source heat pump model:	Serial number:
HVAC company:	Name:
Installation date:	Phone:
Electrician:	Name:
Installation date:	Phone:

CE

MARKING:

The CE mark is the manufacturer's declaration that the product conforms to EU legal requirements. Gebwell Ltd affirms that the product meets all of the requirements of relevant EU directives. The purpose of the CE mark is to facilitate the free movement of goods on the internal market in Europe.

2 INSTALLATION RECORD:

The heating system must be inspected in accordance with applicable regulations before commissioning. The inspection must be performed by a qualified person. The installation log should be completed before the equipment is handed over to the end-user. A completed installation log is a precondition for the validity of the warranty.

Inspected	Description	Comment
	COLLECTOR:	
	Circulation direction checked	
	System pressure-tested	
	System rinsed	
	System bled	
	Fluid quantity in the collector	
	Strainer checked/cleaned	
	Expansion tank	
	Initial pressure of the expansion tank (0.5 bar)	
	Strainer/flow direction	
	Safety valve checked	
	Shut-off valves checked	
	Length of the collector _____ m	
	- If there are several loops, record the lengths: _____ m	

Checked by _____ (date)

	HEATING SYSTEM:	
	System filled	
	Accumulator coil filled / bled (coil accumulator)	
	System pressure-tested	
	System rinsed	
	System bled	
	Safety valve	
	Diaphragm expansion tank	
	Initial pressure of the expansion tank	
	Strainer checked/cleaned	
	Pressure measuring device	
	Shut-off valves	
	Filling valve	
	Buffer accumulator	
	Heating circuit control set	
	Circulation water pumps	
	Rotation direction of pumps	
	Actuators	

Checked by _____ (date)

	DOMESTIC HOT WATER:	
	System filled	
	System pressure-tested	
	System rinsed	
	Safety valve	
	Pressure measuring device	
	Buffer accumulator	
	Hot water circulation	

Checked by _____ (date)

Inspected	Description	Comment
	ELECTRICITY:	
	Building fuses	
	Heat pump fuses	
	Phase sequence	
	Power supply	
	Regulation group(s)	
	Supply water sensor(s)	
	Room temperature sensor	
	Outdoor temperature sensor	

Checked by _____ (date)

	CONTROLLER:	
	Room set point for the heating circuit	
	Heating curve gradient set	
	Minimum set point for supply water to the heating circuit	
	Maximum set point for supply water to the heating circuit	

Checked by _____ (date)

	GENERAL:	
	Wiring in accordance with the installation instructions	
	Connection seals	
	Device started up in accordance with the instructions	
	Operation of the machine monitored on site for 30 minutes	

Checked by _____ (date)

	GUIDANCE FOR THE END USER:	
	Adding fluid to the collector	
	Increasing the pressure of the heating system	
	Setting the heating regulation curve	
	App user interface guidance	

Checked by _____ (date)

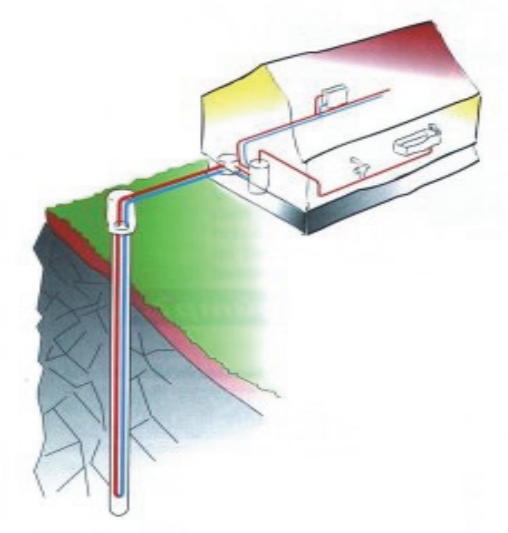
3 GROUND SOURCE HEAT AND GROUND SOURCE COOLING

A well-designed ground source heating system with the correct power values offers low operating costs and good energy efficiency. The ground source heat pump enables you to efficiently heat your indoor air and domestic hot water. In the summer, the system can also cool indoor air in an environmentally friendly way.

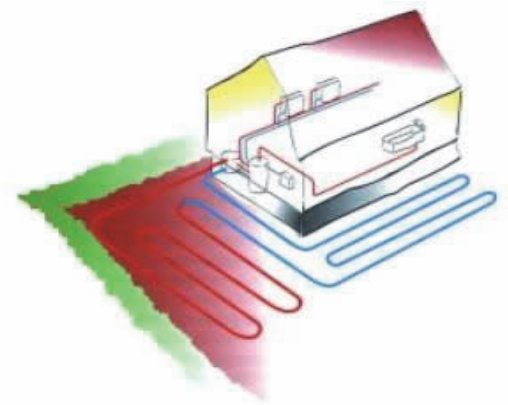
3.1 Heat from the ground

The ground source heat pump collects heat from the ground and brings it into the building. Heat can be collected using either a network of pipes embedded in a bored well, a heat collection pipe network installed close to the soil surface, or a network of pipes anchored to the bottom of a body of water.

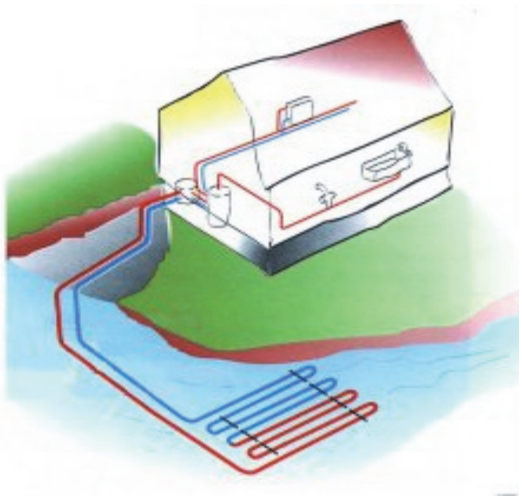
Bored well as a heat source



Soil as a heat source



Watersystem as a heat source



Further information about heat collection systems and their designs can be found on the websites of Gebwell Ltd. and the Finnish Heat Pump Association (SULPU).

www.gebwell.com

www.sulpu.fi

3.2 Ground cooling

The low temperature of the brine can also be used to cool your home. In the summer, free cooling energy can be transferred from the ground using only a water circulator pump. The ground source heating system can be connected to the ventilation fan convector or an underfloor heating/cooling system designed for cooling.

3.3 Operating principle of a heat pump

The heat pump consists of four main components

- Evaporator
- Compressor
- Condenser
- Expansion valve

Aries 6 and Aries 12

The solar energy stored in the soil is collected by the brine circulating in the heat collection pipe (9/10) networks.

In the evaporator (4), the energy contained in the brine is transferred to the refrigerant, which absorbs the heat energy as it evaporates. The brine returns to the ground approximately 3°C cooler than when it came. The brine entering the heat pump can be no colder than -5°C.

The pressure and temperature of the refrigerant increase in the compressor (3). The refrigerant also absorbs the heat energy created by the compressor's work.

The warm refrigerant is transferred into the condenser (2). The condenser transfers the heat energy from the refrigerant into the water circulating (11/12) in the house's

heating system, which distributes it to heat the building and the domestic hot water with the help of a change-over valve (5). The refrigerant condenses into a liquid state in the condenser as it loses heat energy.

The pressure of the refrigerant remains high as the liquid refrigerant is transferred to the expansion valve (7). The pressure of the refrigerant decreases in the expansion valve, and the temperature drops to approximately -10°C. The expansion valve injects the correct amount of refrigerant into the evaporator (4), where the heat energy transferred from the brine causes the refrigerant to evaporate.

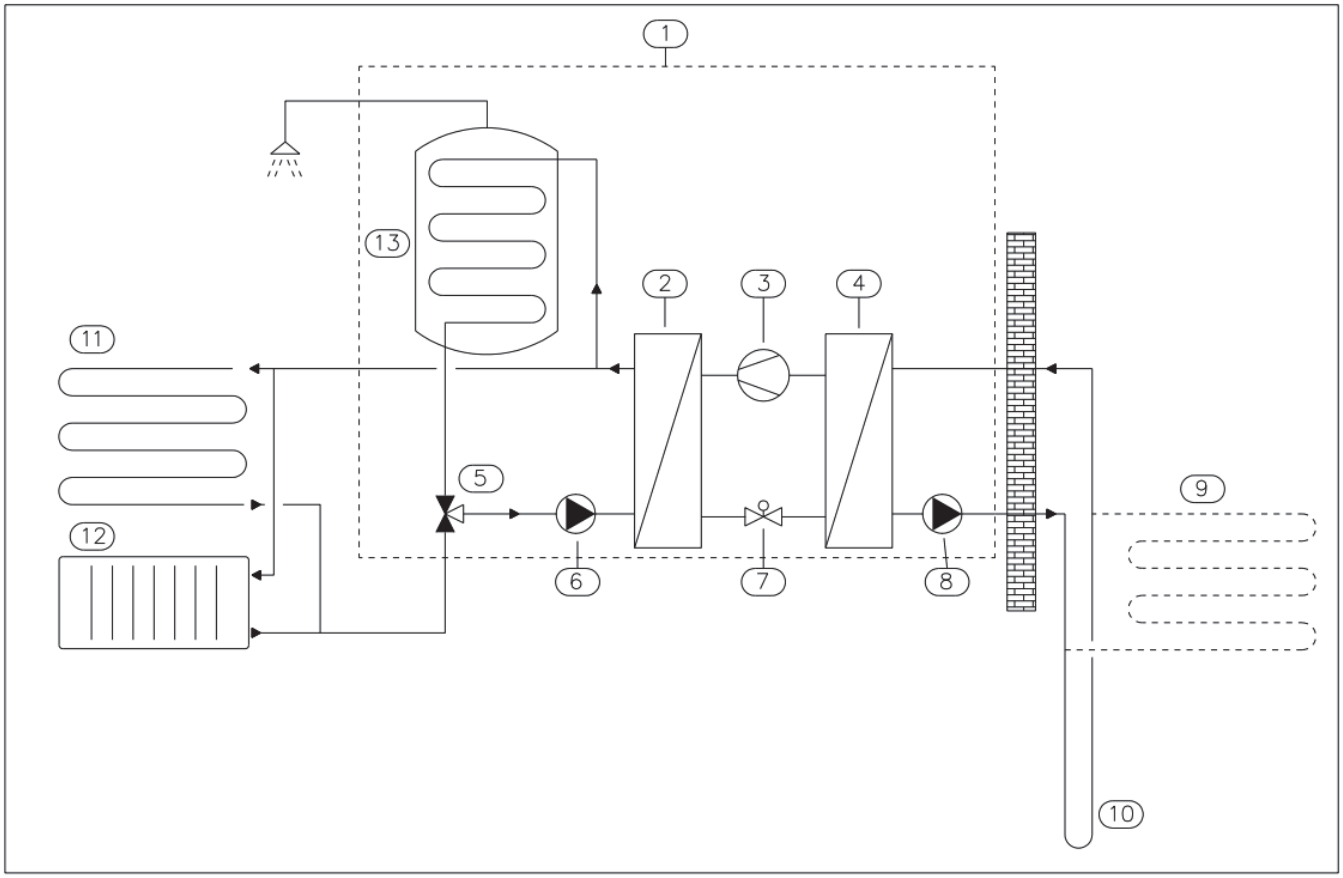


Figure: Functional description Aries 6 and Aries 12

1: Heat pump

2: Condenser

3: Compressor

4: Evaporator

5: Change-over valve

6: Water circulator pump, heating/domestic hot water charge

7: Expansion valve

9: Collection pump

9: Heat collection pipe, ground loop

10: Heat collection pipe, bored well

11: Underfloor heating

12: Radiator heating

13: Hot water tank

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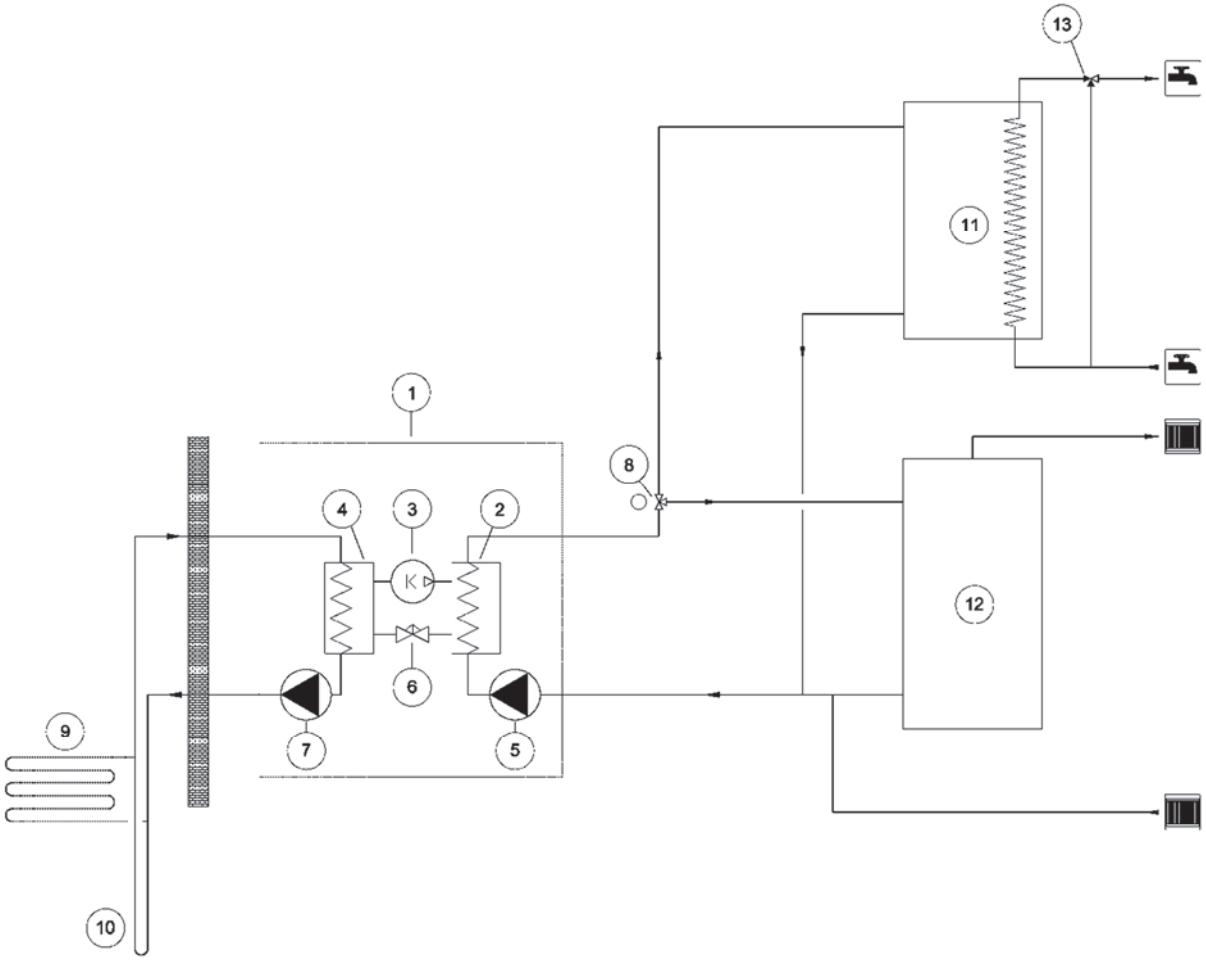


Figure: Functional description Aries 12C

1: Heat pump

2: Condenser

3: Compressor

4: Evaporator

5: Change-over valve

6: Water circulator pump, heating/domestic hot water charge

7: Expansion valve

9: Collection pump

9: Heat collection pipe, ground loop

10: Heat collection pipe, bored well

11: Underfloor heating

12: Radiator heating

13: Hot water tank

3.5 Heating functions

Domestic hot water

The heat pump outputs domestic hot water based on the tank's operational measurement sensor (B3). The temperature of domestic hot water can be selected from the options, *Eco*, *Normal* or *Comfort*. This selection affects the amount of hot domestic hot water. When *Comfort* is selected, the heat pump also uses an electric heater to heat domestic hot water.

Heating

The heat pump outputs heating water directly into the building's heating network. Automatic regulation determines the set point for the supply water from the heating circuit based on the set heating curve and the outdoor temperature measurement. The controller uses the set value for the supply water to determine the set point for the heat pump, and the frequency-controlled compressor uses this value to set itself to the correct rotation speed in order to keep the temperature of the supply water at the set point. The room temperature sensor also affects the set point.

In order for the heat pump to operate at maximum efficiency, the heating system and the collector must be under ideal conditions. The difference between the heating system's output and return temperatures must be 5–8°C, and the difference between the collector's output and return temperatures must be 3–4°C. If the temperature differences deviate from these values, the efficiency will decrease, along with the savings. The heat pump's controller ensures the correct temperature difference for the heat supply and the collection pump.

Factory settings:

Heating temperature difference: 5°C

Domestic hot water preparation temperature difference: 8°C

Collector temperature difference: 3°C

3.6 Tips for making savings

The heat pump is intended to generate the desired heat and domestic hot water. The system attempts to meet these desires by all available means within the limits of the set values.

Important factors affecting energy consumption are the indoor temperature, the domestic hot water consumption, the temperature of the domestic hot water, the quality of the house's insulation, and the desired level of comfort.

Keep the aforementioned factors in mind when changing the device's settings.

IMPORTANT:

Floor heating and radiator thermostats can have a negative impact on energy consumption. They reduce the flow rate in the heating system, and the heat pump compensates for this by raising the temperature of the network. This affects the device's operation by causing more electrical energy to be consumed. Thermostats are only intended for adjustments due to "free heat" (from the sun, people, fireplaces, etc.)

4 IMPORTANT:

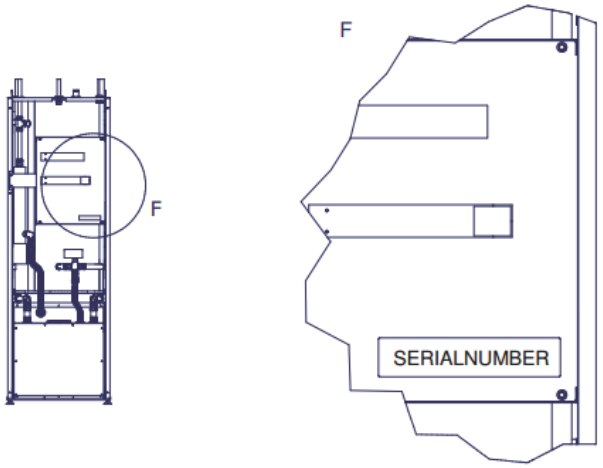
These installation instructions describe installation and maintenance measures that should only be carried out by a professional.

The installation instructions should be given to the customer in the manual folder.

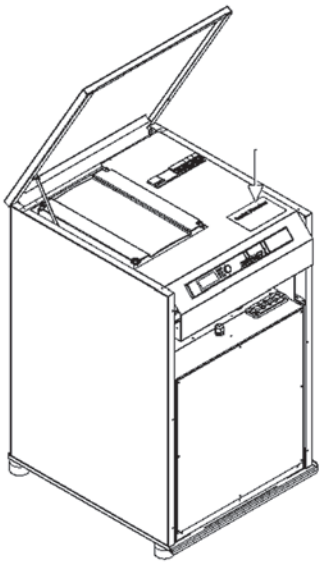
After commissioning, the heat pump automatically sends telemetry data to the Gebwell Smart cloud. Storing data in the cloud allows device history information to be displayed in the Gebwell Smart control room as well as system optimization. The data can also be used for maintenance and product development purposes.

4.1 Serial number

The device's serial number is on the ID plate, which is attached on the cover panel of the control unit, as well as on the back cover of the user manual.



In the Aries 12C without built-in accumulator, the ID plate is attached to the heat pump on the control unit cover, under the heat pump cover. The cover can be lifted from the front edge up on the hinges at the back edge of the cover.



Keep in mind that you will need to know the device's serial number whenever you contact the manufacturer, maintenance or support services.

4.2 Safety instructions

The following safety instructions must be kept in mind when handling, installing and operating the device.

- Only lift the device at the locations shown in the instructions.
- The metallic edges of the heat pump could injure your hands when you are moving the unit. Use slash-resistant gloves to move the heat pump.
- Always unplug the device before servicing.
- Never jeopardise safety by bypassing safety devices.
- The refrigeration compressor unit in the device must only be serviced and repaired by a qualified person.
- Do not rinse the heat pump with water.
- During installation, keep all of the device's housing panels intact to prevent water from splashing onto the device's electrical components.

4.3 Hazardous substances

Electricity

The electrical components inside the heat pump carry a potentially fatal current. Unplug the device before you open the protective plate on the control unit or the compressor module.

Refrigerant

The heat pump contains a refrigerant that is harmful and hazardous to the environment. The refrigerant is in a hermetically sealed refrigerant circuit in the compressor module. If the refrigerant leaks into indoor premises, the room must be thoroughly ventilated.

Heat collection liquid

The mixture of antifreeze agents, including ethanol, used as the heat collection liquid are highly flammable. Avoid splashing the liquid on your skin.

5 DELIVERY AND HANDLING

5.1 Content of the delivery

- Gebwell Aries heat pump 1
- Installation and maintenance manual 1
- User instructions 1
- Outdoor temperature sensor 1
- Room temperature sensor 1
- Safety valve for the heating circuit G1/2" – 2.5 bar 1
- Safety valve for the domestic hot water circuit G1/2" – 10 bar 1
- Power supply cable with plug (32A) 1

5.2 Optional accessories

- Collector valve group
- Installation set
- Cooling extension for installation set
- Heating pump extension for installation set
- Heating control group
- Domestic hot water buffer tank
- Heating buffer tank
- Domestic hot water circulator pump series
- Diaphragm expansion tank for the collector
- Diaphragm expansion tank for heating
- Energy measurement

5.3 Storage

Before installation, the Aries heat pump should be stored in its shipping package in a warm, dry place. If the device is stored in a cold or humid environment, the electrical components may get wet, causing failures in the operation of the device at a later stage.

5.4 Transportation

The panels on the exterior of the heat pump should be removed if the device is being brought into a confined space, and replaced once the device has been moved inside. The heat pump can be tilted temporarily but it must not be left in a slanted position for long periods, even during transportation. The maximum tilt angle for the heat pump is 45°. The heat pump should not be turned onto its side. However, if it is necessary to turn the heat pump onto its side for reasons such as transportation, the compressor unit can be removed during transportation. However, the

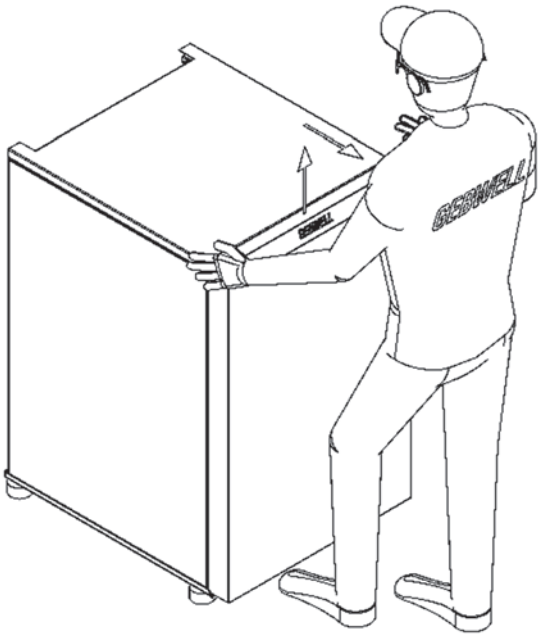
heat pump must not be transported upside down. If it is necessary to tilt the heat pump, the heat pump must be left in the vertical position for at least two hours before starting up to ensure that the lubricating oil in the compressor flows into the right place. The heat pump should only be lifted by the pallet. The device must be transported to the place of installation on the pallet.

5.5 Handling the front door

The heat pump front door has to be removed during operations inside the heat pump. To remove the front door, lift it straight up. Lifting can be assisted with a foot at the bottom. Hold the door firmly so that it does not fall over you. The front door of the heat pump should be removed during operations inside the unit. To reinstall the door, lift the door so that the lip at the bottom of the door goes into the slot on the bottom of the heat pump and the lip on the top of the door sits at the top of the heat pump.

Aries 6 and 12

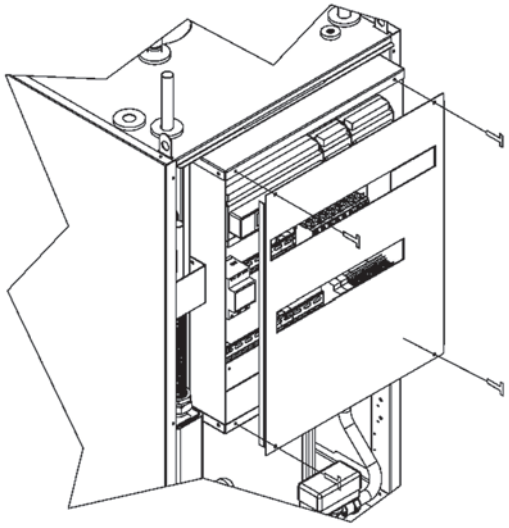
Aries 12C



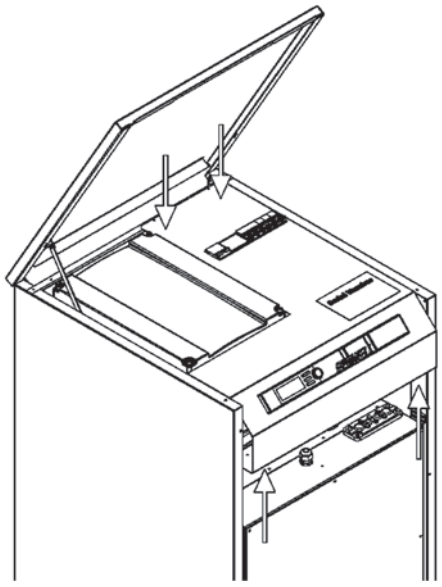
5.6 Detaching the cover of the control unit

The cover of the control unit is attached with four hex screws. You will need a 6-mm ring spanner or socket wrench to open the cover. Hold tight to the

Aries 6 and Aries 12



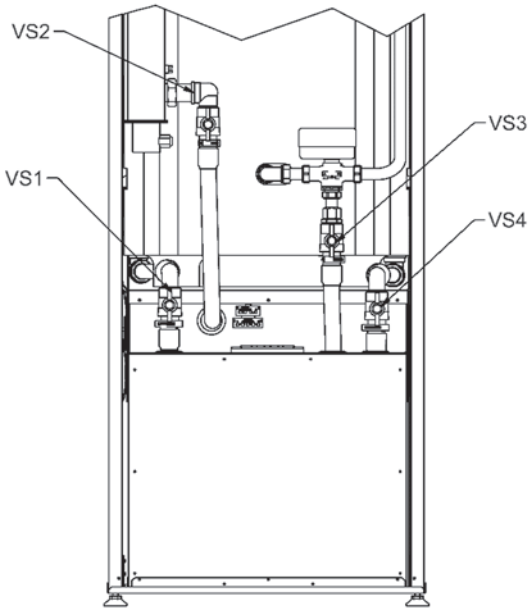
Aries 12C



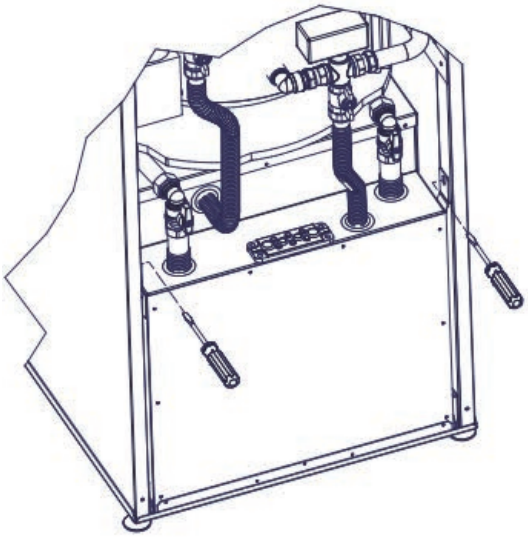
5.7 Pulling out the compressor module

The compressor module can be detached from the heat pump to facilitate transportation and servicing.

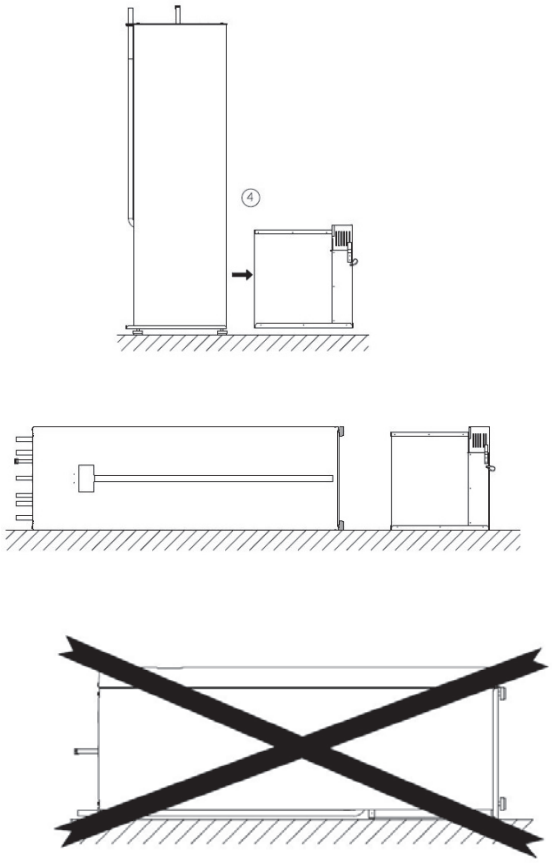
1. Close the shut-off valves (VS1–VS4).
2. Open the insulation from beneath the shut-off valves so that you can open the pipe system's mounting nuts. When you open the mounting nuts, hold on to the key barrel for the flexible pipe underneath using the other key.
3. Turn the shut-off valves of the collection pipes closest to the edge into the horizontal position (the O-ring seals permit this without squeaking).
4. Detach the two screws from the device frame of the compressor module at the mounts on the front edge.
5. Pull the compressor module out using lifting straps intended for this purpose.
6. Detach the pipes from the connections (valves VS1–VS4).



7. Loosen the screws on the compressor unit mounts and detach the compressor unit's plugs from both the electrical switchboard and the compressor unit.



8. Pull the compressor unit out.



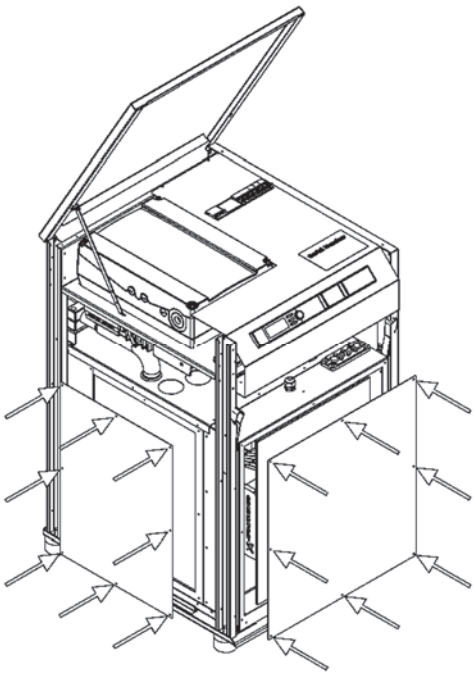
5.8 Removing the packaging

The product is packaged in protective plastic in such a way that it can be installed without removing the plastic. The protective plastic can be retained to protect the heat pump until it is started up.

- Ensure that you have received the correct product with the correct accessories.
- Place the heat pump near the intended installation location.
- Lift the heat pump off the shipping pallet.
- Use the adjustable feet to get the heat pump into a horizontal and stable position.
- Make sure the frame is not in contact with the building's structures, with the exception of the adjustable feet.

5.9 Opening the compressor module – Aries 12C

The Aries 12C ground source heat pump compressor module can be opened from the front, sides and back to facilitate heat pump maintenance.



5.10 Instructions for recycling a decommissioned heat pump

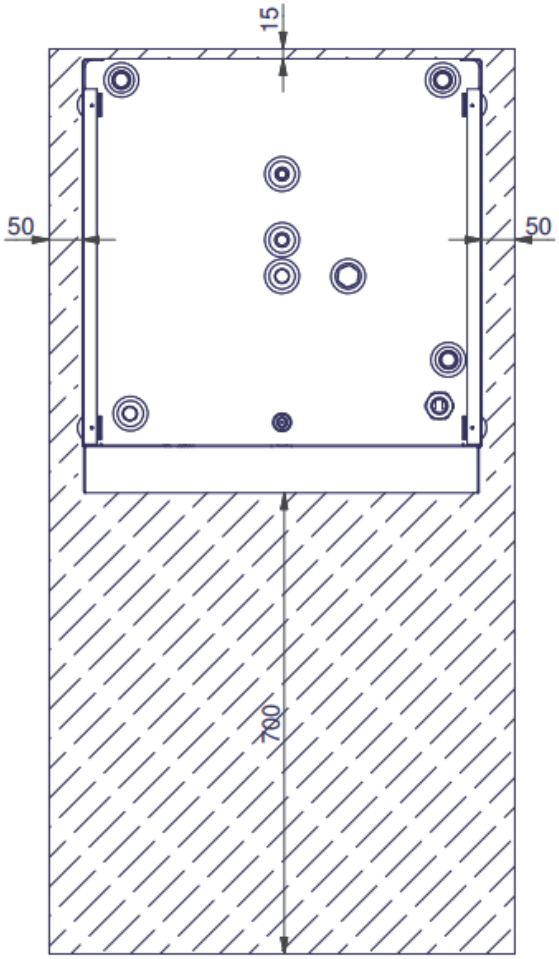
The refrigerants of the heat pump must be removed by an authorised refrigerant installer.

We recommend that the refrigerants be regenerated. Otherwise, the refrigerants must be disposed of as hazardous waste in accordance with local instructions.

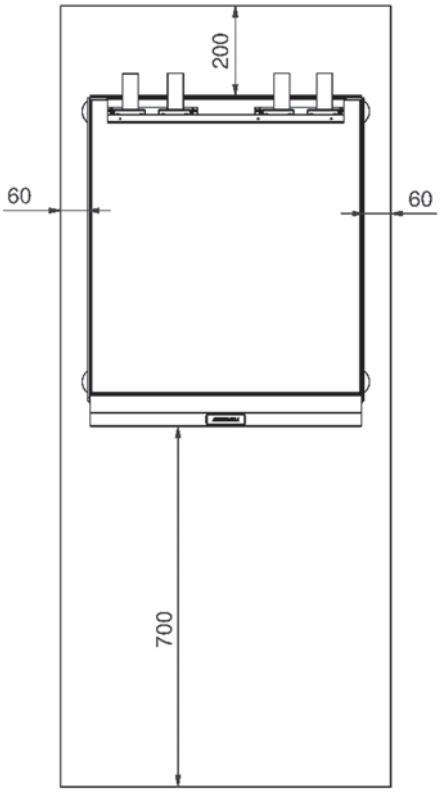
The liquids inside the solution and charge circuit must be recycled in an appropriate manner.

The oils in the heat pump are recovered and disposed of as hazardous waste in accordance with local instructions.

5.11 Heat pump placement



Aries 12C



The placement of the heat pump must take account of a few factors related to safety, convenience and serviceability.

When installing the heat pump, it must be ensured that any water dripping from the heat pump cannot be absorbed in the structures of the building.

The heat pump must be installed in a dry waterproofed room that has a floor drain. The floor must be properly sloped towards the floor drain.

If the installation room is not waterproofed, a drip pan must be installed under the heat pump. An overflow pipe must be connected to the safety valve and routed to a suitable location, such as the floor drain.

The temperature of the placement location must be between +5°C and +30°C. The installation space must be adequately ventilated. Water condenses on the cold sections of pipe in the collector if the space is very humid.

When installing the domestic water heater, it must be ensured that any water dripping from the heater cannot be absorbed in the structures of the building. The domestic water heater must be installed in a dry waterproofed room that has a floor drain. The floor must be properly sloped towards the floor drain. If the installation room is not waterproofed, a drip pan must be installed under the water heater. Sufficient free space must be left in front of the water heater for maintenance. It must be ensured that the heater can be maintained and moved without obstructions. An overflow pipe must be connected to the safety valve and routed to a suitable location, such as the floor drain.

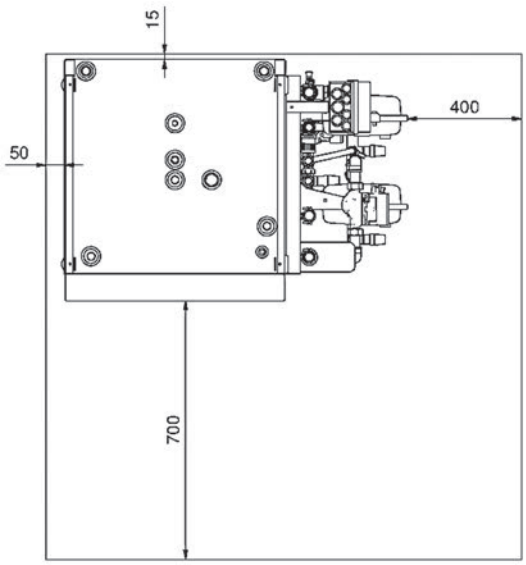
The heat pump's compressor (K1) generates a noise that can be conducted along the structures of the house into

other areas far away. It is advisable to use flexible components for pipe connections. The heat pump should be placed in a location where noise cannot be conducted in a way that adversely affects residential premises. If necessary, supplementary noise insulation can be installed in the wall structures between the heat pump's installation location and residential premises, and additional rubber cushioning can be fitted beneath the heat pump's feet. We recommend placing the heat pump in a separate utility services room. Noise can be prevented from travelling through structures by using solutions such as special floor structures in the area reserved for the heat pump. A cast floor that is separated from the building's other areas can prevent noise from travelling through the floor and into residential premises.

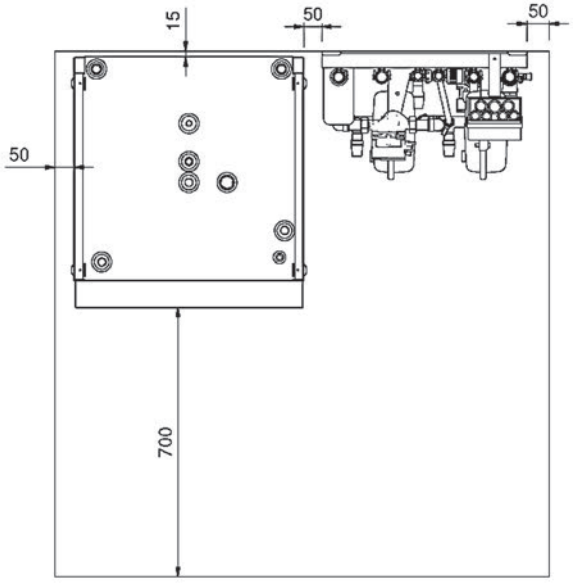
At least 700 mm of clearance should be reserved in front of the heat pump to allow the compressor unit to be pulled out for servicing. For the same reason, the device must not be installed below the floor surface. Adequate clearance should be left behind the heat pump to prevent vibrations from being transmitted onward. In addition, clearance of 600 mm should be reserved to the side of the heat pump if you would prefer to connect the collector's pipes to either side of the heat pump rather than the top.

When installing a factory-made installation group with the Aries heat pump, a clearance in accordance to the picture below should be reserved around the heat pump.

Installation group installed on the side of the heat pump:

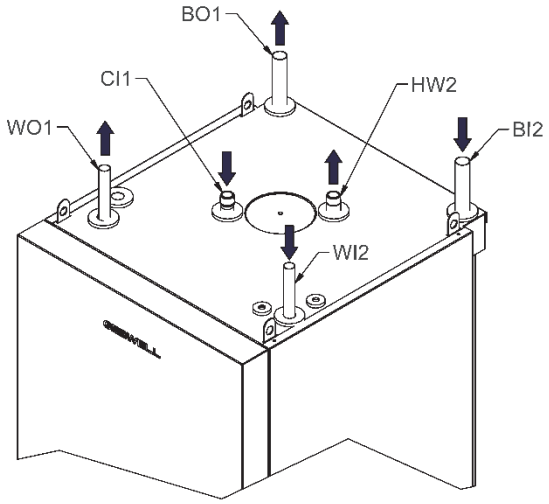


Installation group installed onto the wall beside the heat pump:



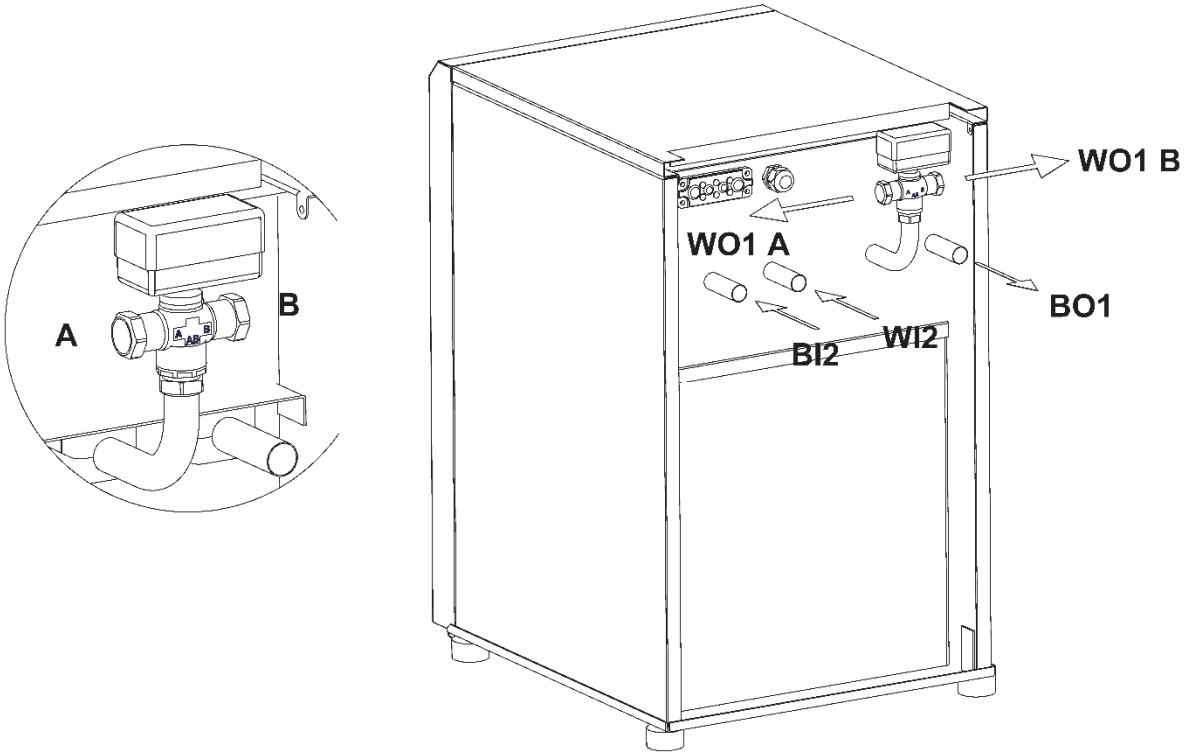
6 DIMENSIONS AND PIPE CONNECTIONS

6.1 Pipe connections



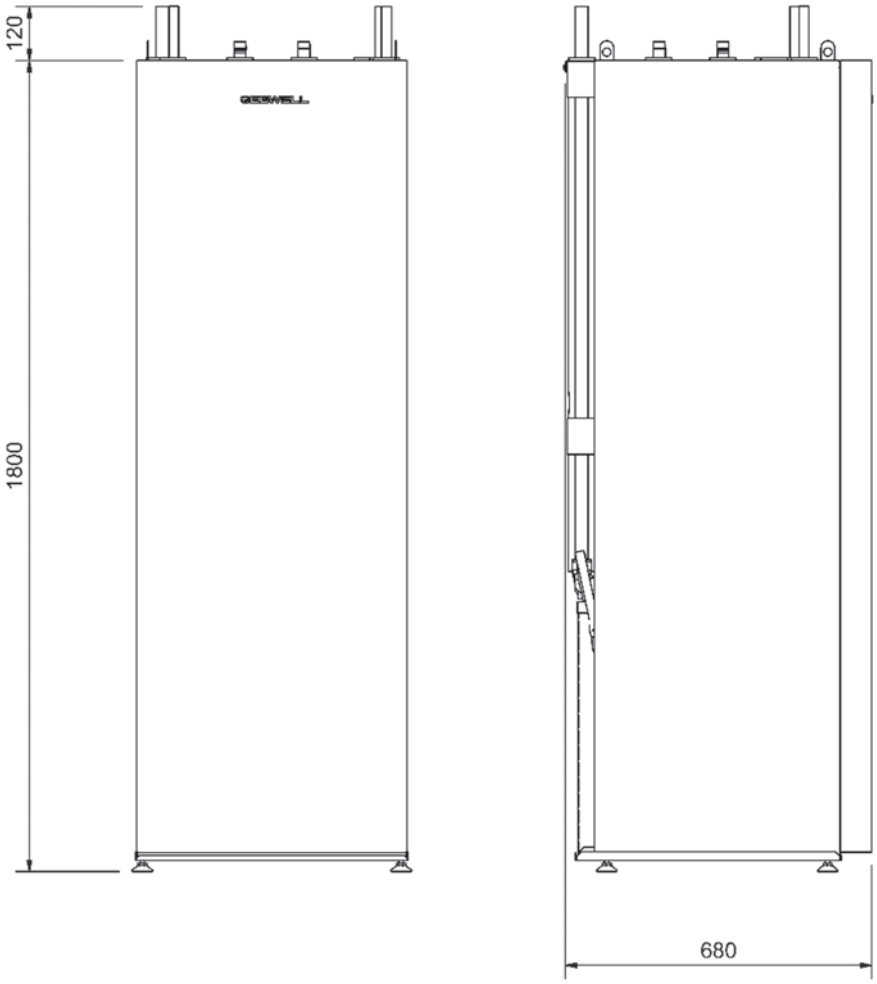
		Aries 6	Aries 12/12C
BO1	Brine to the ground, Cu	28mm	28mm
BI2	Brine from the ground, Cu	28mm	28mm
WO1	Heating supply, Cu	22mm	28mm
WI2	Heating return, Cu	22mm	28mm
CI1	Cold water, stainless steel	22mm	22mm
HW2	Domestic hot water, stainless steel	22mm	22mm
HWC3	Hot water circulation, stainless steel	15mm	15mm

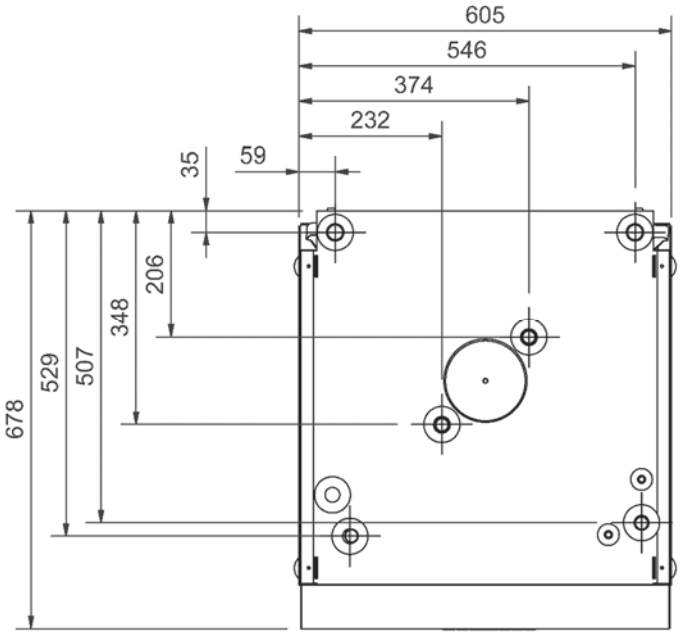
6.2 Pipe connections Aries 12C



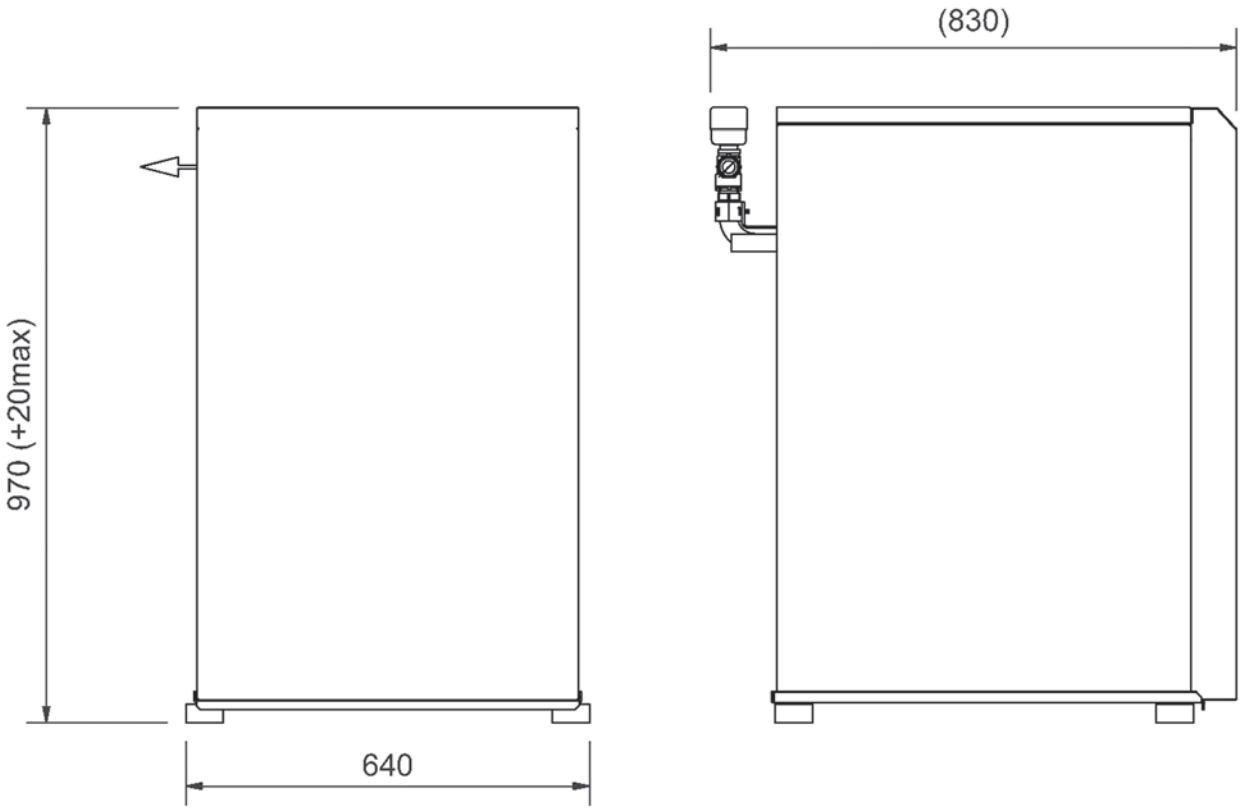
6.3 Heat pump dimensions

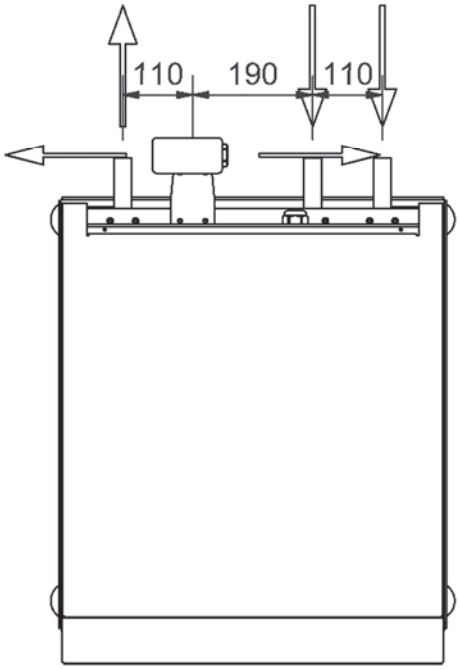
Aries 6 and Aries 12



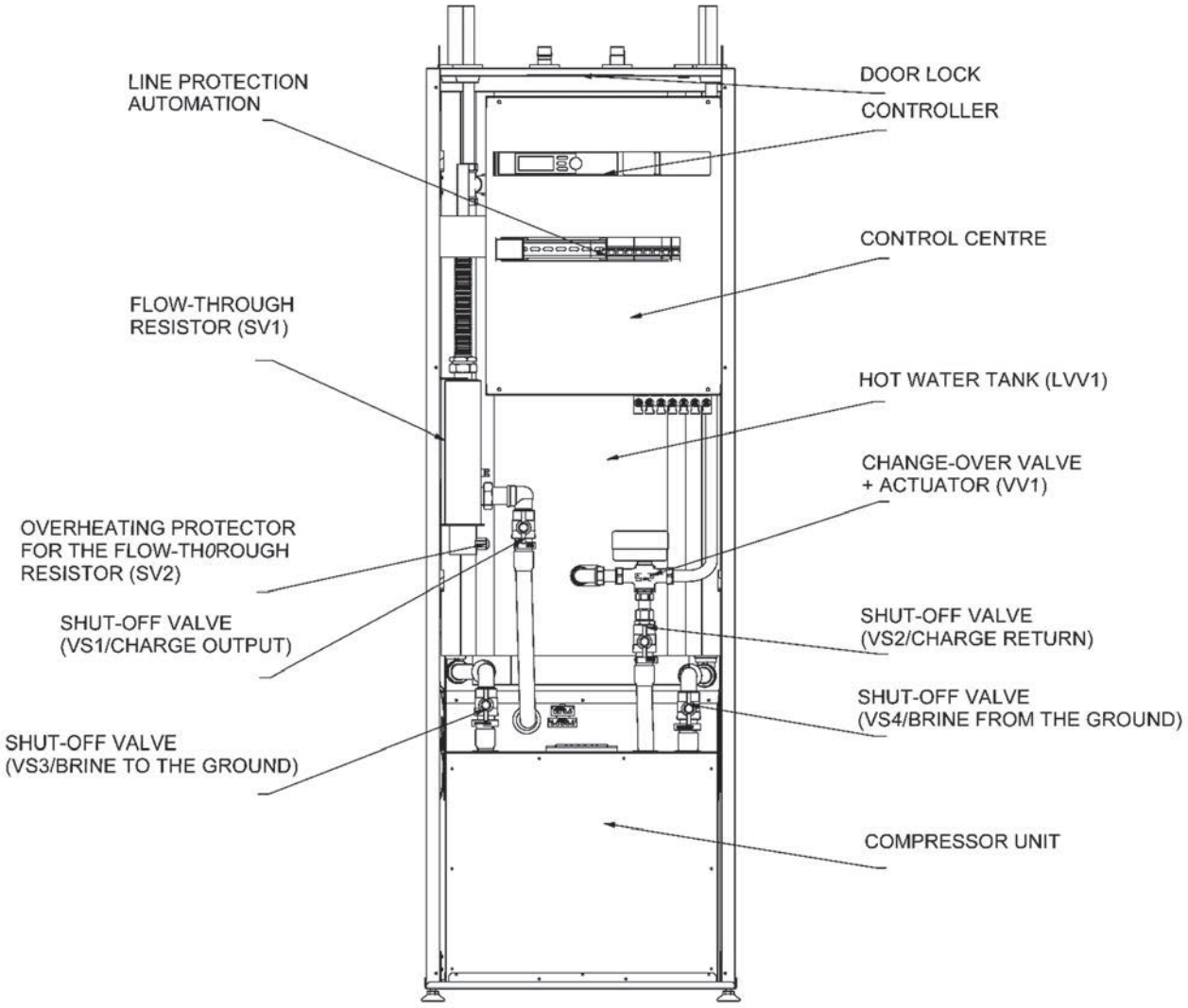


Aries 12C

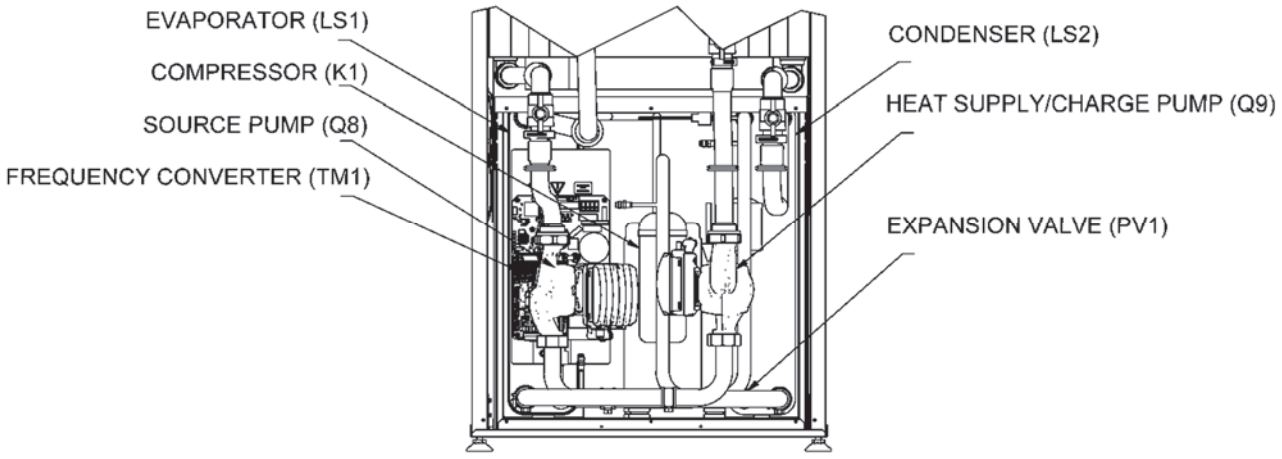




6.4 Heat pump components



Compressor unit components:

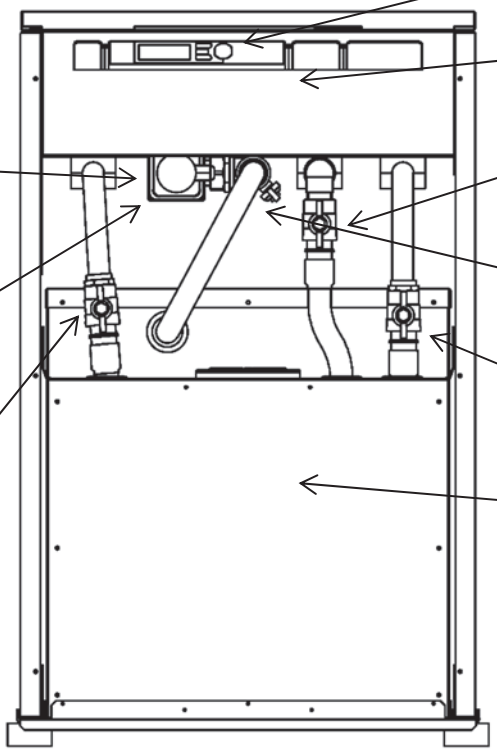


Aries 12C

LINE PROTECTION AUTOMATION

(under cover plate)

Aries 12C from front



CONTROLLER

CONTROL CENTRE

SHUT-OFF VALVE

(VS2/CHARGE RETURN)

SHUT-OFF VALVE

(VS1/CHARGE OUTPUT)

SHUT-OFF VALVE

(VS4/BRINE FROM THE GROUND)

INSIDE THE COMPRESSOR UNIT:

- HEAT SUPPLY/CHARGE PUMP (Q9)
- SOURCE PUMP (Q8)
- COMPRESSOR (K1)
- FREQUENCY CONVERTER (TM1)
- EXPANSION VALVE (PV1)
- EVAPORATOR (LS1)
- CONDENSER (LS2)

FLOW-THROUGH RESISTOR (SV1)

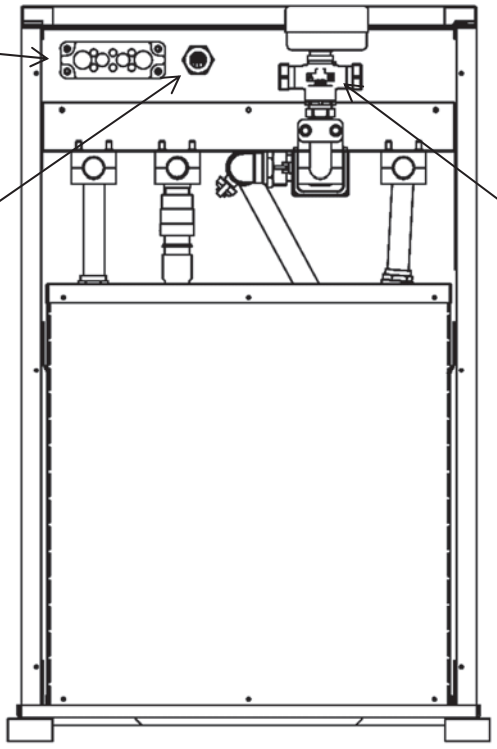
OVERHEATING PROTECTOR FOR THE FLOW-THROUGH RESISTOR (SV2)

(automatic)

SHUT-OFF VALVE

(VS3/BRINE TO THE GROUND)

Aries 12C from behind



MULTIPLE FLANGE FOR ELECTRICAL TRANSMISSION TO THE CONTROL CENTER

POWER SUPPLY LEAD THROUGH

CHANGE-OVER VALVE + ACTUATOR (VV1)

(behind the heat pump)

6.5 Heat pump sensors

Functional and measuring thermal sensors are installed in the heat pump. The sensors are attached to components and insulated from external heat. Some of the sensors are located in the compressor unit module.

B2 Domestic hot water (tank)

B3 Domestic hot water (operation)

B21 Charge heating water supply (heating supply)

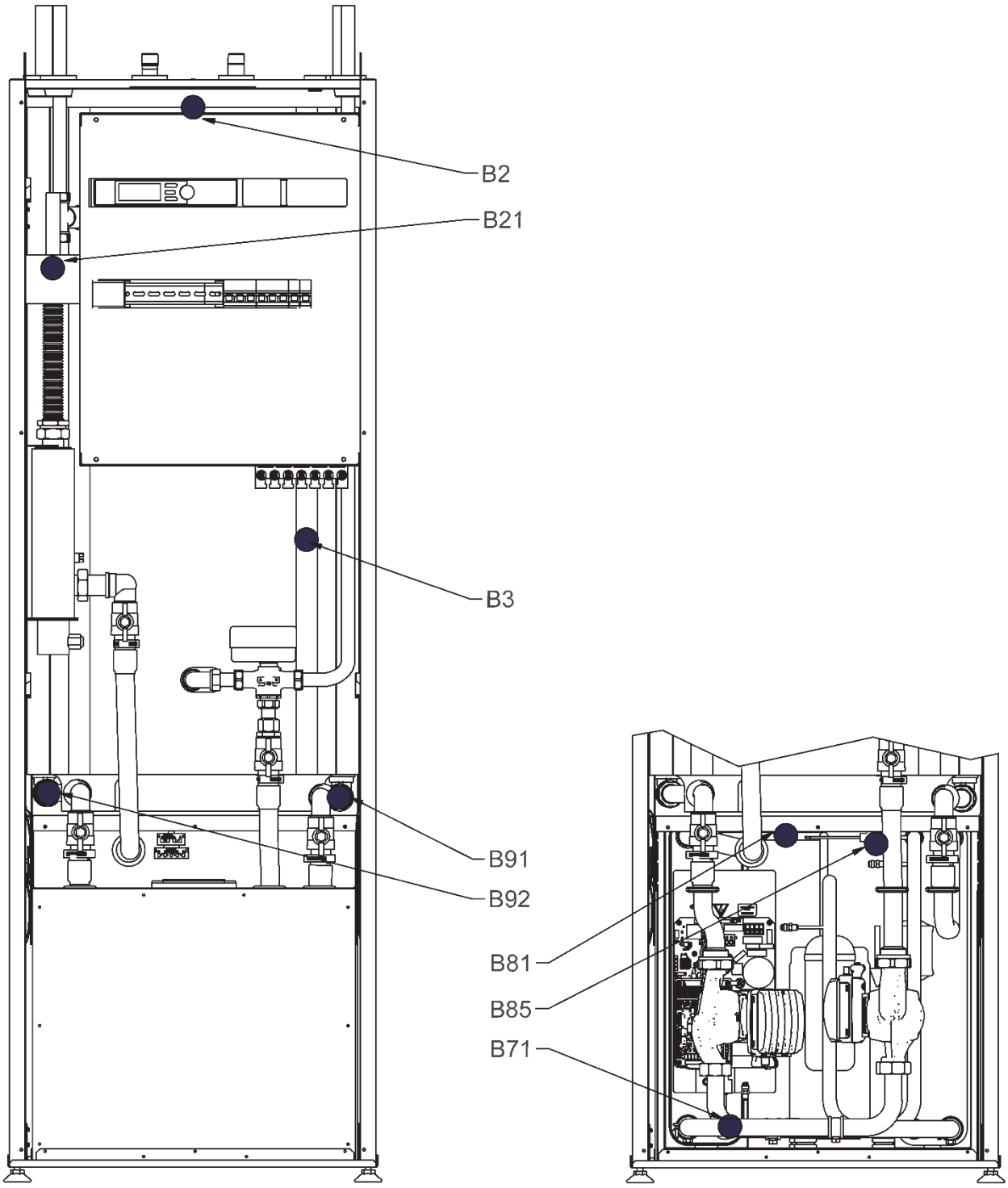
B71 Charge heating water return (heating return)

B91 Brine from the ground

B92 Brine to the ground

B81 Hot gas

B85 Suction gas



7 PIPE INSTALLATION

7.1 Collector

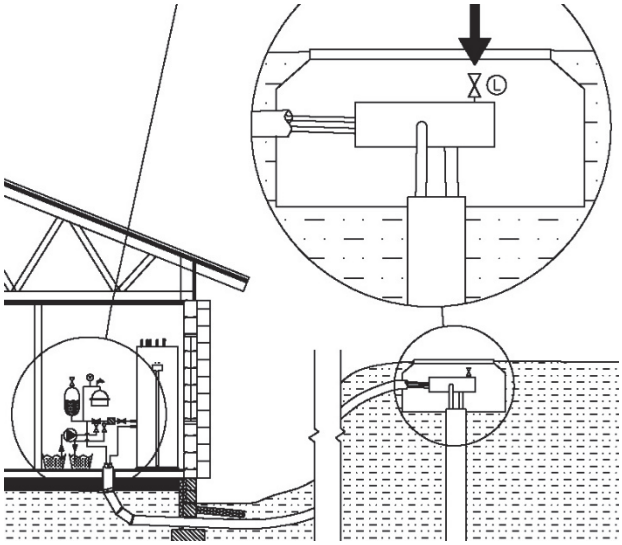
When using PEM pipes 40 x 4.2 PN6.3.

Device	Recommended collector pipe length (m)	Recommended active drilling depth (m)
Aries 6	300 – 400	100 – 160
Aries 12	380 – 500	160 – 300

These figures are approximate example values. Before commencing installation, the building's heat requirement should be precisely calculated.

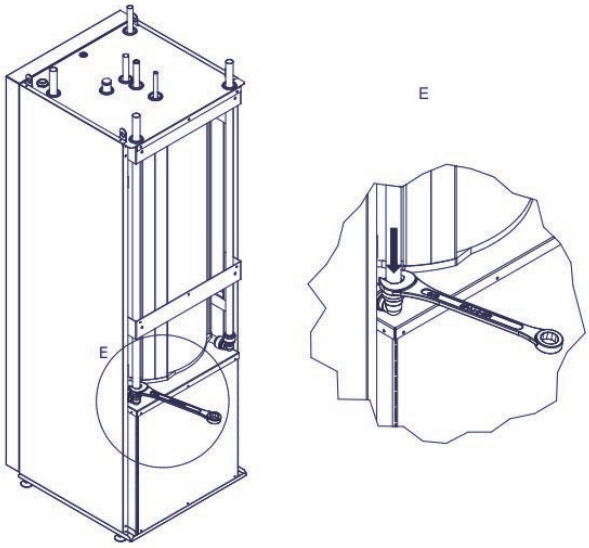
The maximum recommended length of one loop of the collector is 400 m. If a longer heat collection pipe network must be installed, the networks should be divided into several loops and connected in parallel. The connection should be made in such a way that it is possible to balance the flows in the loops.

The collecting pipe network should steadily rise towards the heat pump to prevent air pockets. If this is not possible, purge valves should be installed at the high points.



Before installing the heat pump, rinse the collector pipe network to remove any impurities that may remain after installation.

The collector connection must be selected before the device is put into position. The connection can be placed on the right, left or behind instead of using a top connection. At least 600 mm of clearance must be reserved in the outbound direction.



1. Remove the cellular rubber insulation from the end of the pipe
2. Take note of the sensors when you make changes to the pipe network
3. Detach the collection pipes from the elbow fitting by pressing down on the plastic collar on the claw coupling using a spanner.
4. Detach the pipes from the top connection and turn the elbow fitting in the desired direction.
5. If necessary, cut the pipe to the desired length.
6. Reattach the pipe by pressing on the elbow fitting

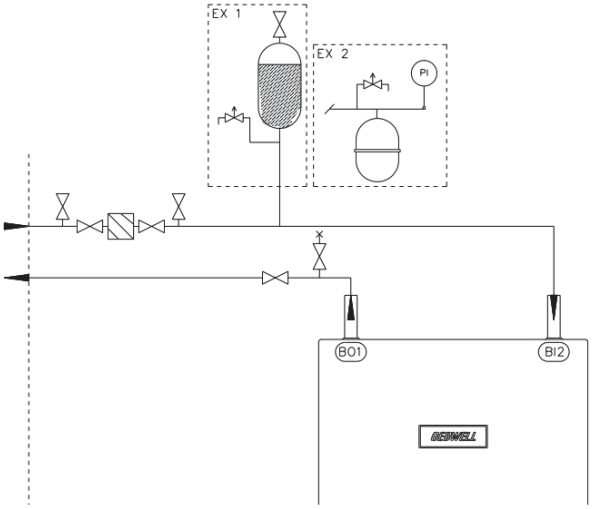
- Insulate all of the collecting pipes in the building using closed-cell insulation to prevent condensation.
- Use rubber-insulated brackets for pipes.
- Place the level expansion tank at the highest point on the collector, on the inbound pipe before the heat pump.
- Mark the name of the brine liquid used on the level expansion tank and in the installation log.
- Install shut-off valves in pipe connections as close to the heat pump as possible.
- Make sure that the top of the heat pump and the electrical equipment are entirely free of water during operation.
- Water may condense on the surface of the level expansion tank. Locate the level expansion tank in a place where condensed water is not able to drip onto the heat pump.
- Connect the collector's valve group with the related expansion tanks as shown in the diagram. The arrow on the poppet seat indicates the flow direction. The valve group size is DN25. Do not connect pipes smaller than 28 mm.

To avoid condensation tape the service shut-off valves before commissioning of the heat pump. The valves have not been pre-taped, as the valves may need to be used during commissioning. Insulating

tape can be found in the equipment bag. A non-taped valve handle condenses water that will drip onto the device.

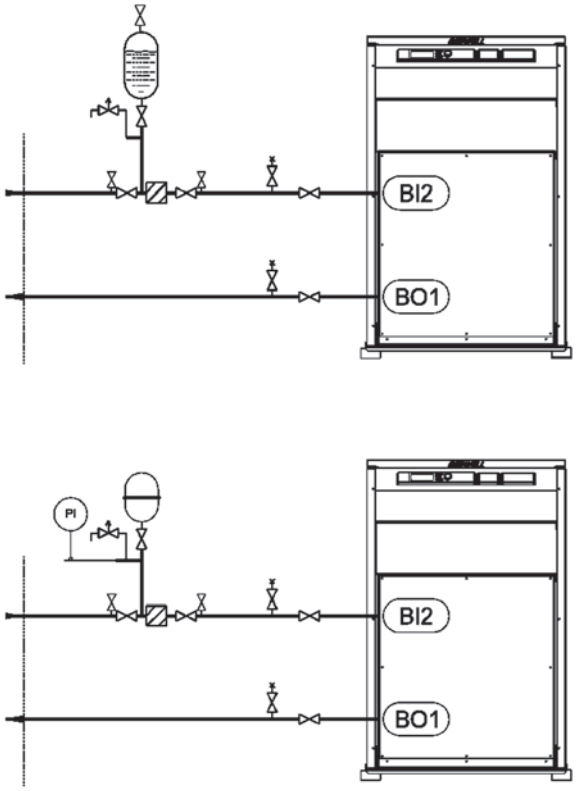
- The collector must be pressure-tested with 3 bars of pressure and the test pressure must be sustained for at least 30 minutes.
- Only connecting components designed for cold conditions should be used in the collector.

Connection alternatives

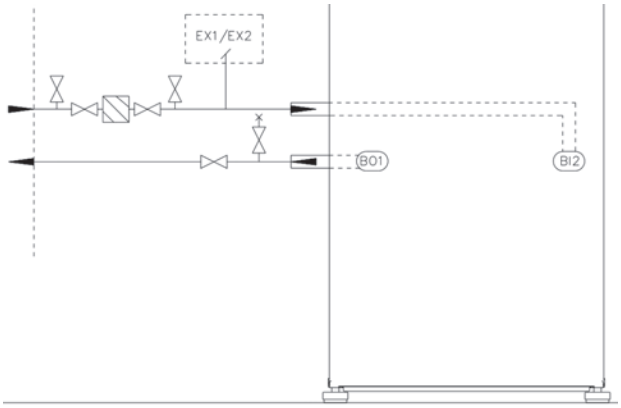


The collector can be depressurised using the level expansion tank (EX1). The level expansion tank should be installed at the highest point in the circuit so that air can rise into the tank. **Do not connect the expansion tank to a lateral branch as this may prevent air from rising freely.** If the level expansion tank cannot be installed at the highest point in the circuit, the system must be made pressurised (EX2). In such cases, a diaphragm expansion tank should be used, and this is available as an accessory. In cooling systems, the collector must be made pressurised.

Aries 12C

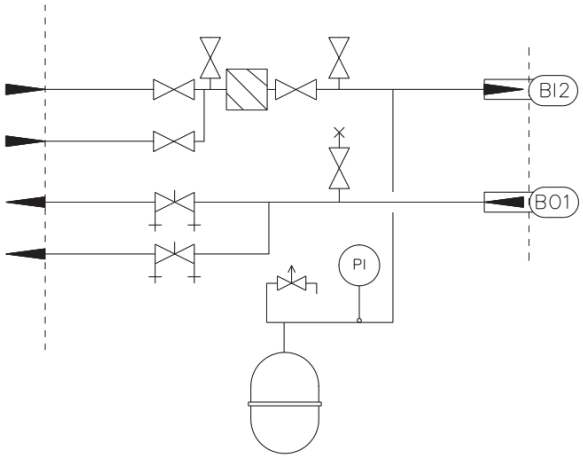


Connection to the side



Installing the collector onto several loops

If you are using several collector loops, every circuit must have shut-off and control valves. Follow the valve manufacturer's instructions when you install control valves. The valve must be installed in such a way that it is easy to regulate and inspect, and it does not freeze. Purge the circuits of air one at a time and regulate the flow rate in relation to the lengths of the circuits. Try to use collection loops of equal length.

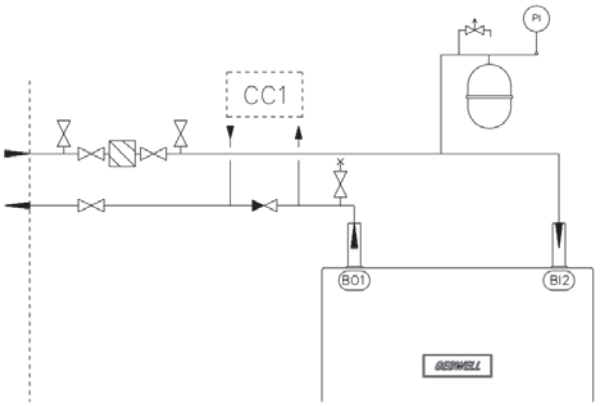


Ground cooling

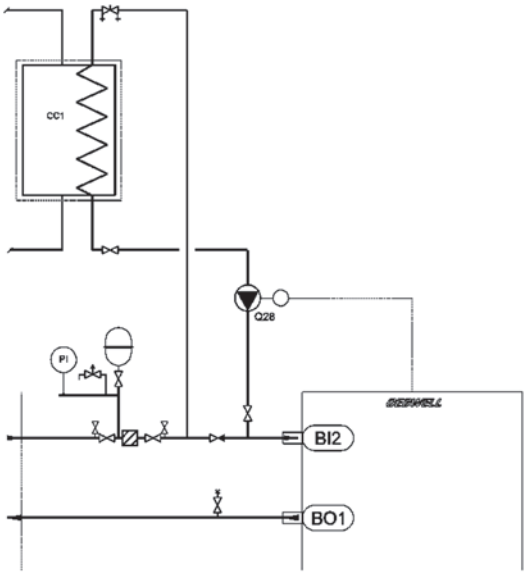
Ground cooling functions best when heat collection is arranged using a bored well. During the summer, loops installed in the soil or in lakes may be at such a high temperature that the required cooling power cannot be obtained. Air within the collector should be allowed to freely rise to the expansion tank. Purging should always take place at the highest point in the collector. If it is necessary to connect the cooling radiator to the highest point in the circuit, purging should take place via the radiator.

Refrigeration can be controlled/regulated using the WPOL945C refrigeration accessory available for the heat pump. Building automation or ventilation machines can also control the heat pump's internal source pump. See the electrical diagrams for instructions.

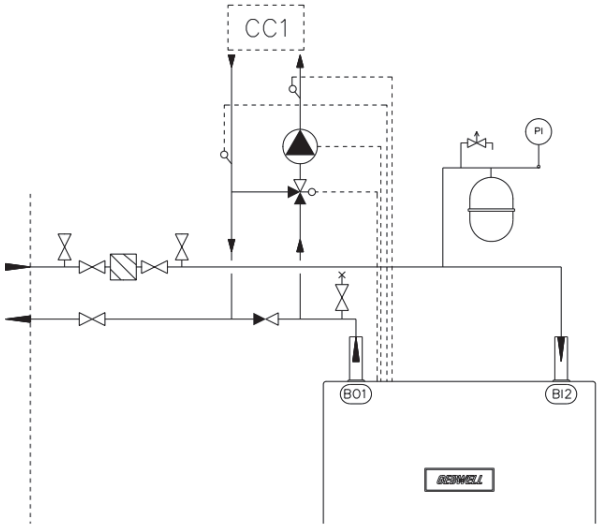
Cooling outputs Aries 6 and Aries 12



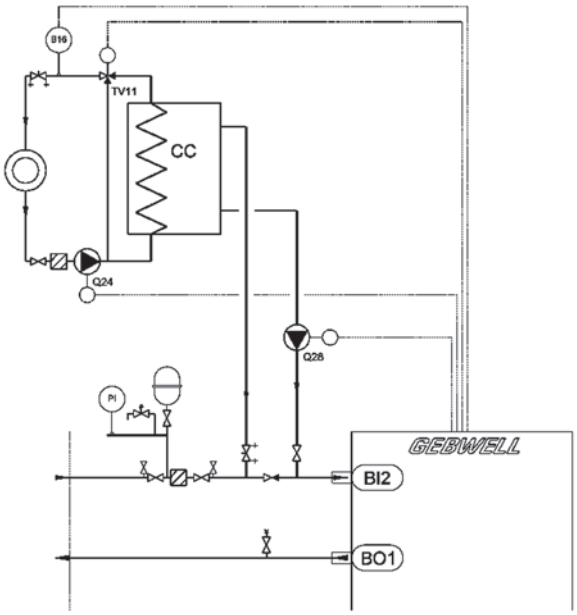
Cooling outputs Aries 12C



Control circuit Aries 6 and Aries 12



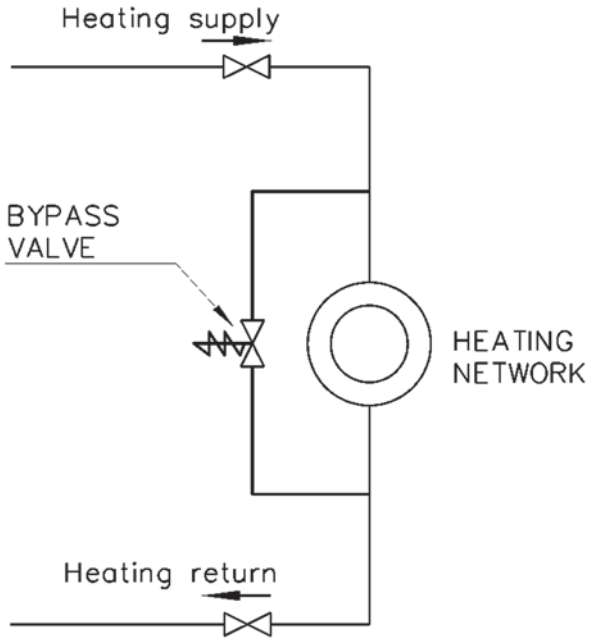
Control Circuit Aries 12C



7.2 Heat supply circuit

The heating system controls the indoor temperature with the help of the control regulator and radiators, underfloor heating, ventilation or convector fans.

- Before installing the heat pump, rinse the pipe network in the building's heating system to remove any impurities that may remain after installation.
- Install the required protective devices, strainer, shut-off and non-return valves. The shut-off valves must be installed as close to the heat pump as possible.
- It is advisable to install the heat pump in a closed heating system with a diaphragm expansion tank.
- Make sure that the top of the heat pump and the electrical equipment are entirely free of water during operation.
- The product must be protected from overpressure using a safety valve. The opening pressure of the safety valve can be a maximum of 2.5 bar and it should be installed in the heating system's return pipe. It is advisable to lead the safety valve overflow pipe to the nearest floor drain. The overflow pipe should be installed in such a way that water is able to flow out of the overflow pipe unobstructed.
- If the device is connected to a system equipped with thermostats, bypass valves should be installed in every radiator or a few thermostats should be removed to ensure an adequate flow rate. See the *Technical details* table for the device's minimum flow rate.



The purpose of the bypass valve is to ensure that the heat generated by the heat pump can be driven even if all underfloor heating circuits and / or radiator thermostatic valves are closed.

System components:

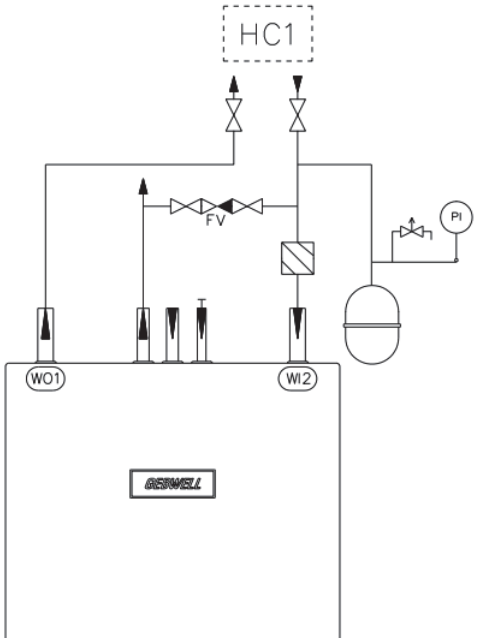
Bypass valve

Flow meter, A

The minimum flow must be maintained even when all valves are closed.

Adjust the bypass valve to the minimum speed of the charge pump (factory setting 50%). The thermostats must be closed when adjusting the bypass. You can run the charge pump manually from the service menu with the test function. Be sure to set the test to AUTO at the end.

Connecting the heating system

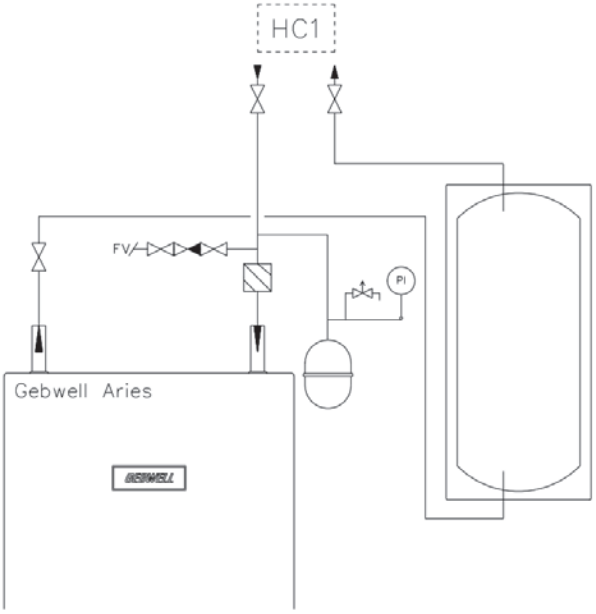


Buffer tank for the heating system

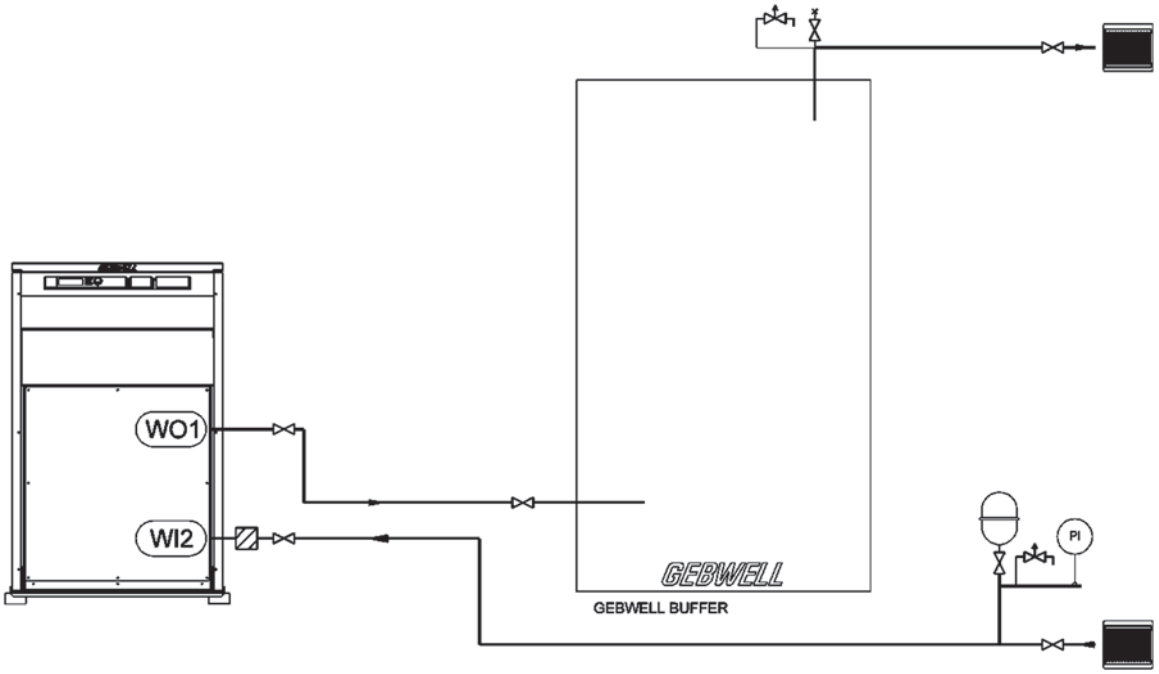
If the fluid volume of the heating system is too low in relation to the power of the heat pump, a heating buffer tank should be used. The internal heating circulator pump acts as the heating system's pump.

NOTE: Ensure the minimum flow rate of the device using bypass valves or by leaving a sufficient number of open circuits in the heating network. The minimum flow rates for each device are shown in the *Technical details* table.

Aries 6 and Aries 12



Aries 12C

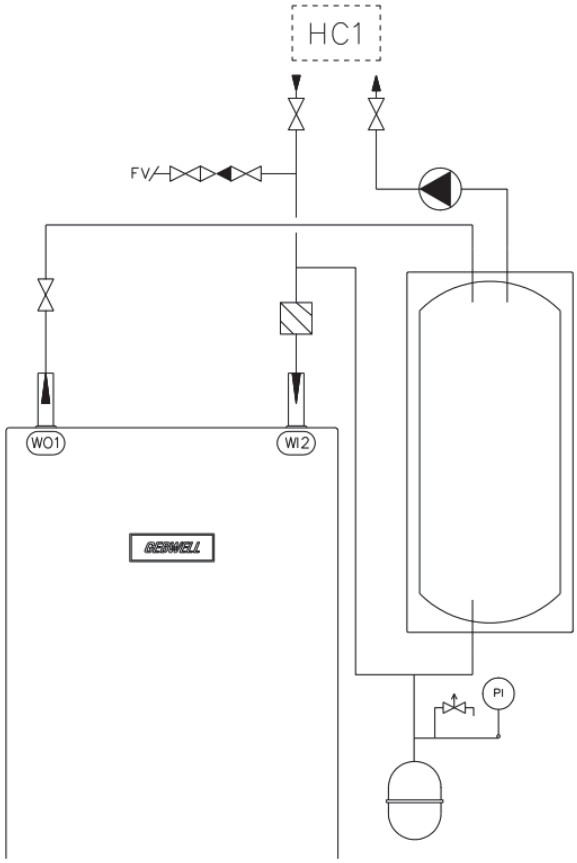


Aries 6 and Aries 12

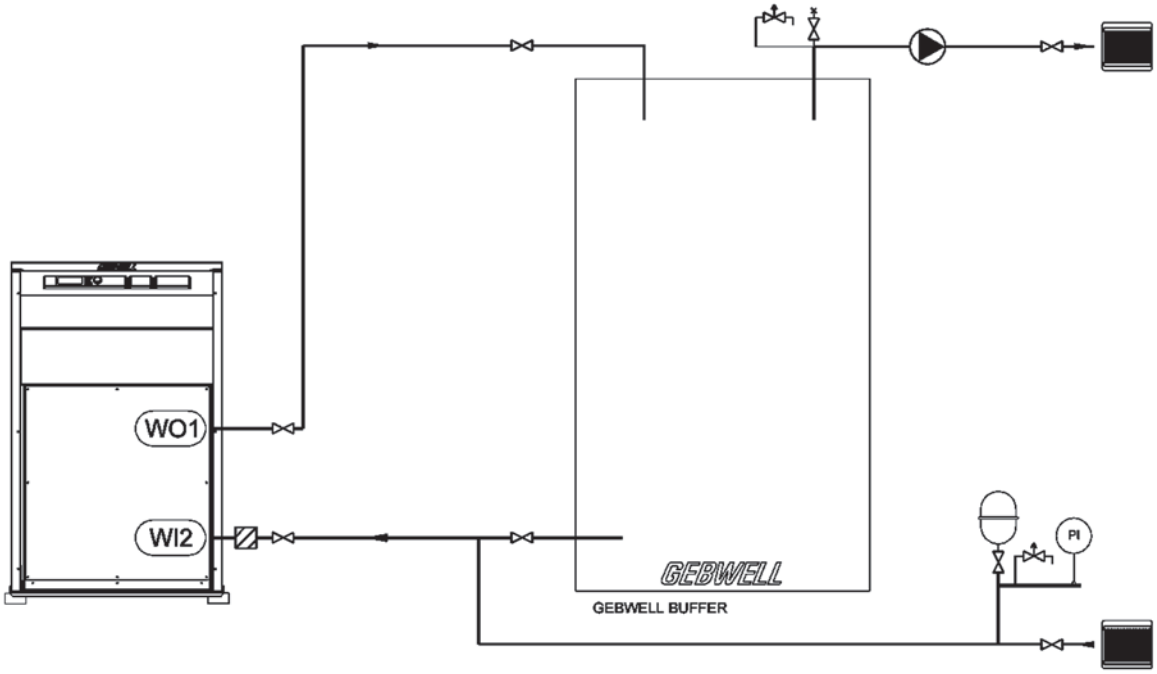
Heating system with an external heating water circulator pump and buffer tank

If the heating system requires an external water circulator pump, the pump must be dimensioned to correspond to the needs of the heating system. If the fluid volume of the heating system is too low in relation to the power of the heat pump, a heating buffer tank should be used in the heating system.

Water-circulating post-heating of ventilation should be connected with a buffer tank as well as an external heating water circulator pump to ensure that heat is supplied to the ventilation device.



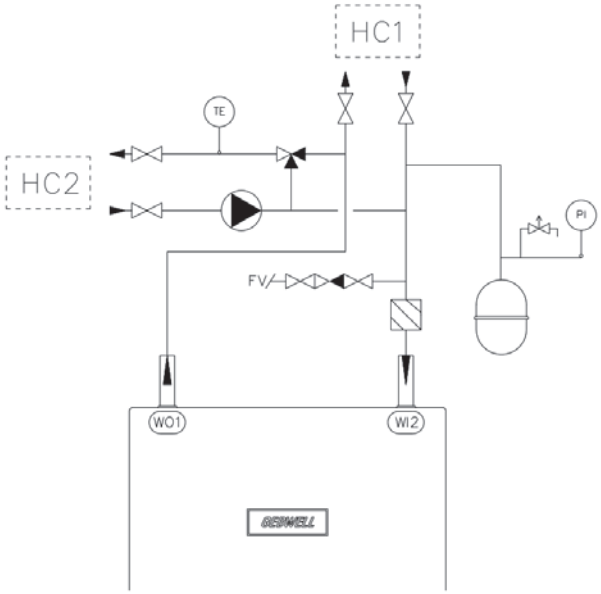
Aries 12C

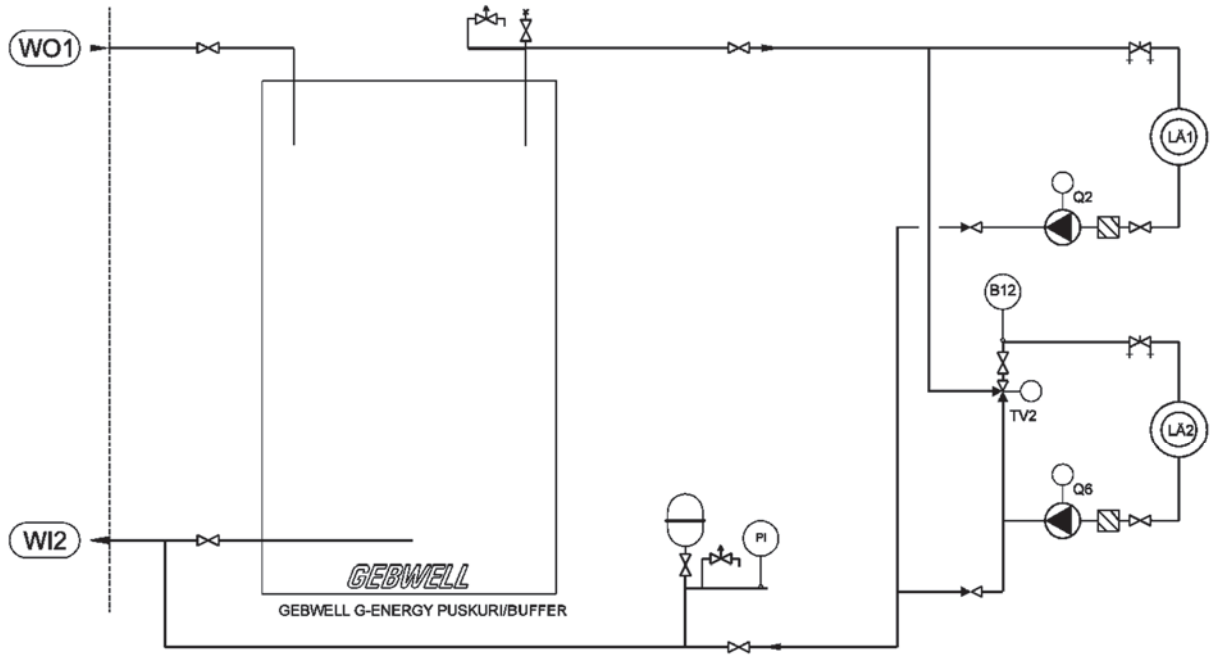


Several heating systems

If there are heating systems in the building using different temperatures, such as radiator heating and underfloor heating, an additional heating circuit should be used. The higher-temperature circuit should always be connected as circuit 1 and the lower-temperature circuit should be circuit 2.

Aries 6 and Aries 12





Connecting the installation set

Installation sets are available as accessories to make the installation of the heat pump quicker and easier. Refer to the connection instructions supplied with the installation set.

7.3 Domestic hot water system

Before installing the heat pump, rinse the building's domestic hot water pipe network to remove any impurities that may remain after installation.

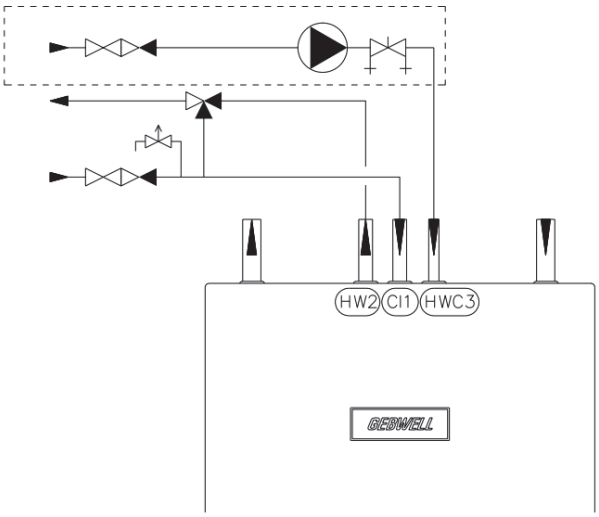
Install shut-off valves in pipe connections as close to the heat pump as possible.

Water must not be allowed to drip on top of the heat pump and the electrical equipment during operation.

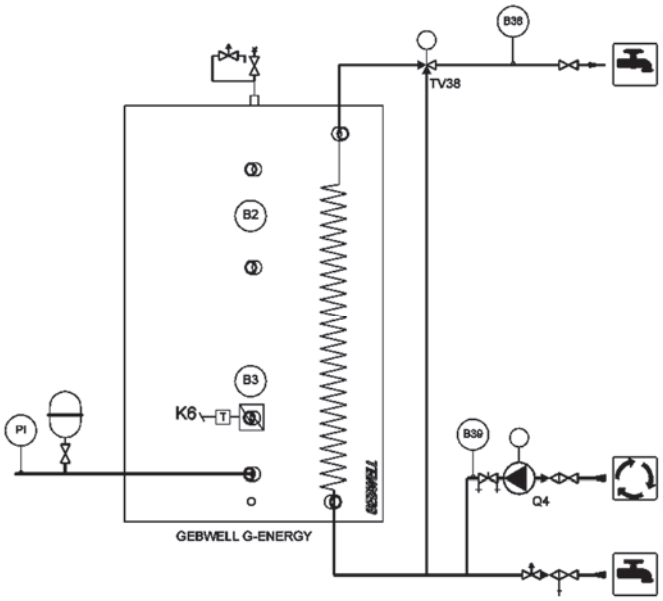
The domestic hot water system should be equipped with a safety valve (max. 10 bar) and it should be installed in the inbound cold water pipe as shown in the diagram. It is advisable to lead the safety valve overflow pipe to the nearest floor drain. The overflow pipe should be installed in such a way that water is able to flow out of the overflow pipe unobstructed.

The domestic hot water safety valve may leak almost constantly when domestic hot water is no longer consumed in large volumes. The overflow is due to the heat expansion of cold water and pressure shocks. The safety valve can be prevented from leaking by installing an expansion tank in the domestic hot water network to level out pressure fluctuations and prevent pressure shocks.

The heat pump's domestic hot water tank is equipped with a domestic hot water circulation connection. The circulation flow should be precisely regulated to ensure that the tank functions. If the flow is too high, it will reduce the temperature layering in the heat pump's internal tank and weaken the operation of the system.



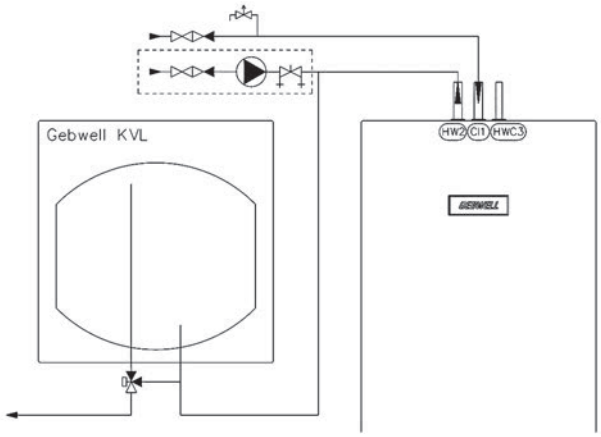
Aries 12C



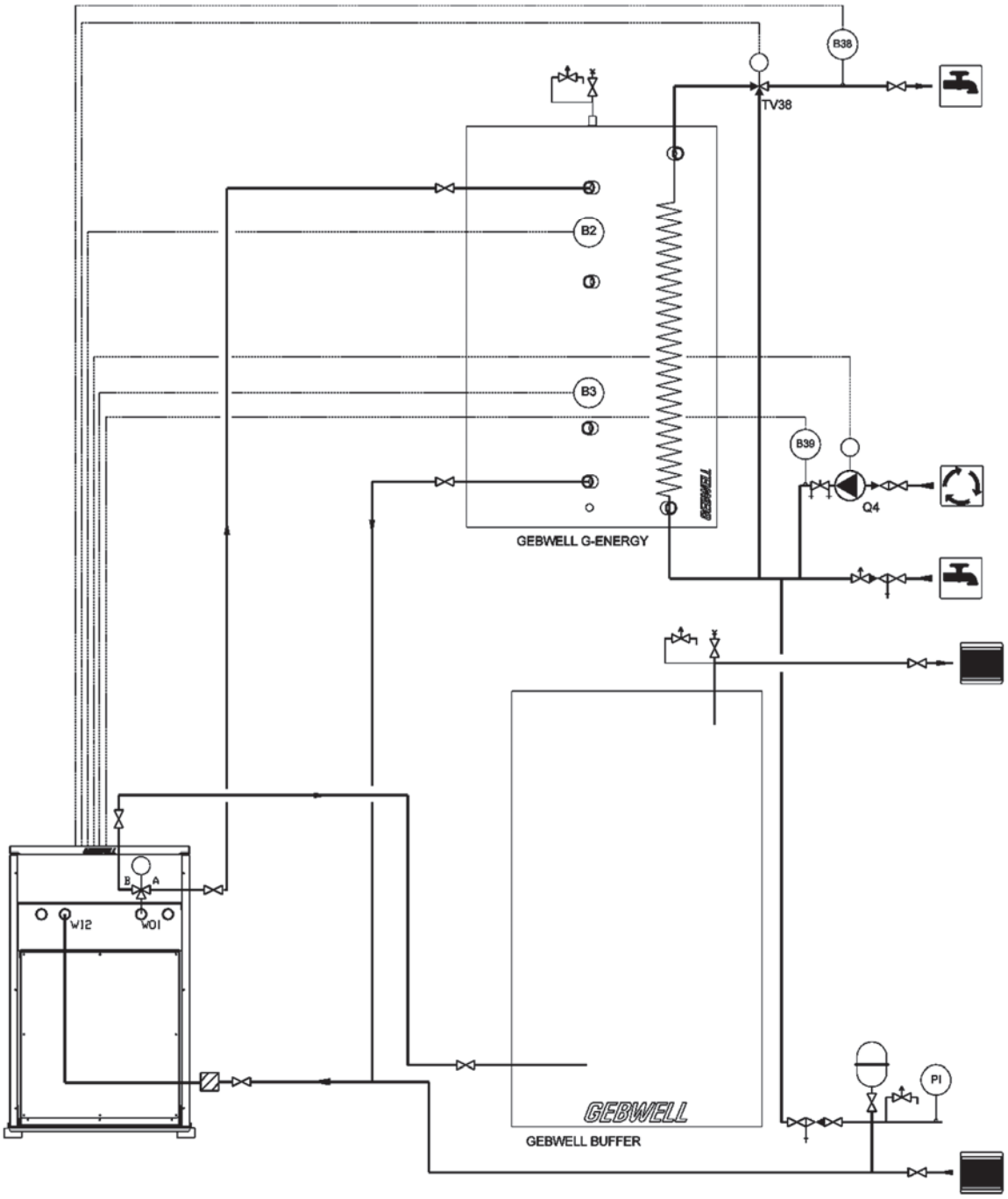
Tank for the domestic hot water system

If domestic hot water consumption is high, the heat pump may be supplemented with a buffer tank using electric heating. The heat pump heats cold water in an internal tank before feeding it to an external buffer tank. The external tank's electric heater keeps the temperature at the desired level. The external tank prepares the system for periods of peak consumption when more heat energy is used.

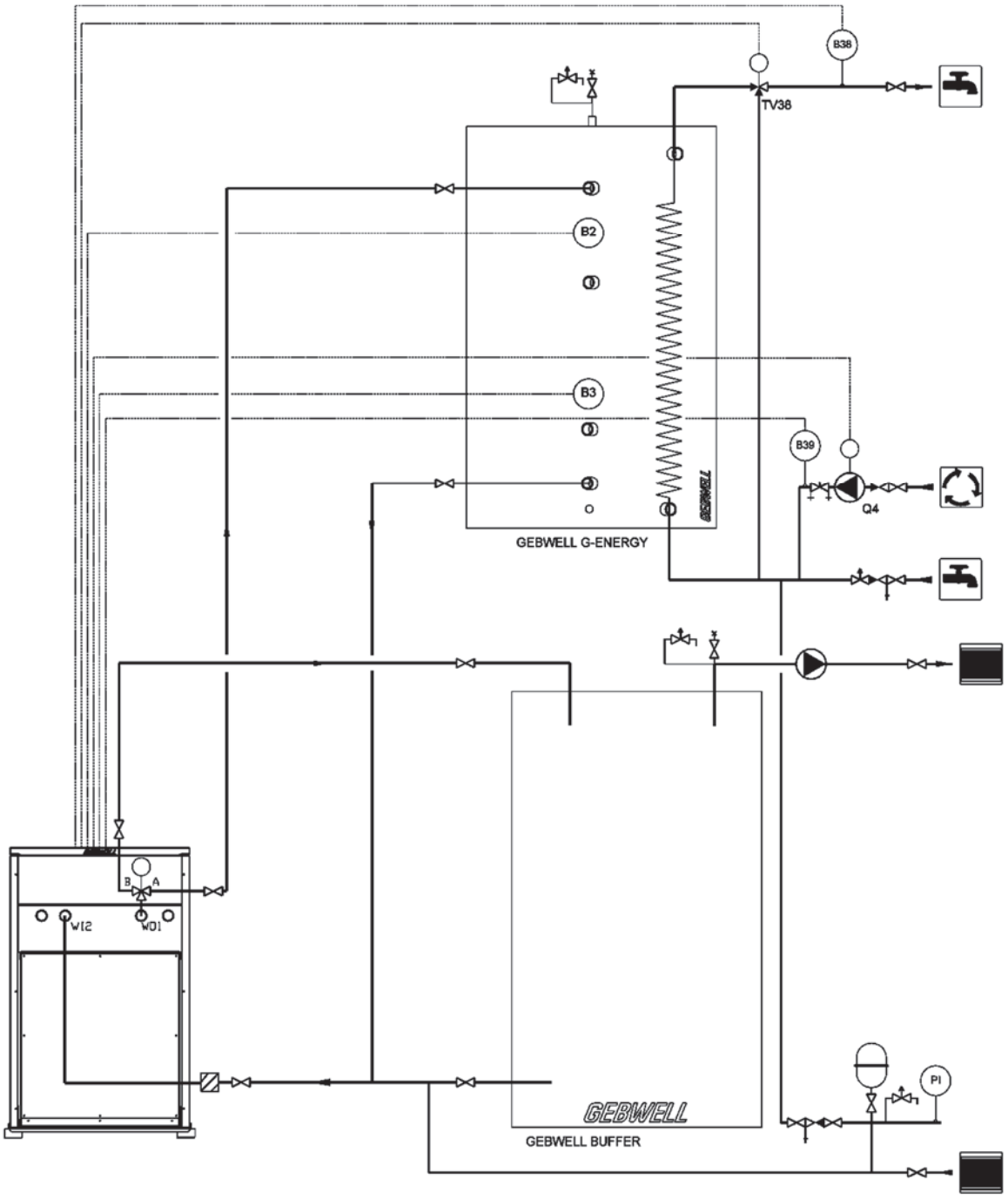
In case there is hot water circulation in the building, we advise using a buffer tank. On some sites, connecting domestic hot water circulation to the heat pump may reduce the temperature layering in the heat pump's internal tank and increase the number of times the compressor is started up.



Aries 12C


B38
TV38
B2
B3
B39
Q4
GEBWELL G-ENERGY
B
A
W12
W01
GEBWELL
GEBWELL BUFFER
PI

Aries 12C – external circulator water pump and buffer tank



8 ELECTRICAL CONNECTIONS

8.1 General

The heat pump is connected to a 400 V (50 Hz) electricity network. The heat pump's plug must not be placed in the socket before the heat pump's heating network has been filled with water. This could cause damage to the electric heater, pumps, protective devices or compressor.

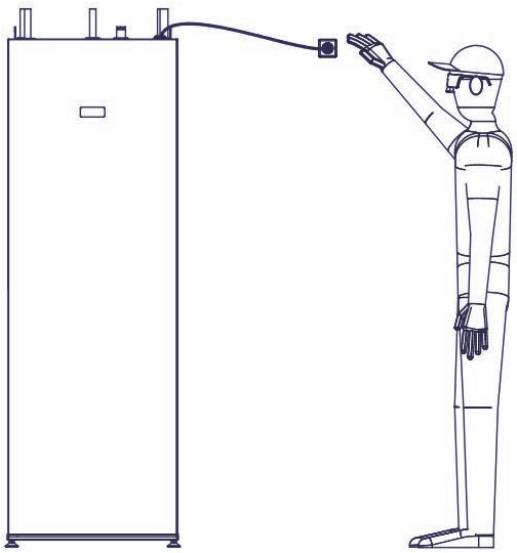
All of the electrical devices except the outdoor temperature sensor and the room temperature sensor are connected at the factory. Only authorised electricians may connect additional electrical accessories to the heat pump.

- The heat pump must be disconnected before the building's insulation is tested.
- The heat pump's circuit diagram can be found at the end of this manual.
- The heat pump's fuse should be type C (slow).
- Cabling for electrical accessories used with the heat pump should use the control unit lead-throughs at the back of the device.

8.2 Power supply

The power supply to the heat pump is implemented with an easy-to-connect high-current power plug connection (PT) and a 2-metre cable. Aries heat pumps have a 32A high-current power plug.

In the immediate vicinity of the heat pump, a high-current power socket is required. The plug acts as the safety switch of the device, which means that the plug needs to be disconnected from the socket during maintenance work. The socket has to be placed so that the plug can be easily unplugged from the socket, if necessary. Even if the premises were provided with residual current devices, the heat pump need not be connectedbehind them, because the heat pump is so-called fixed electrical device that has its own socket.



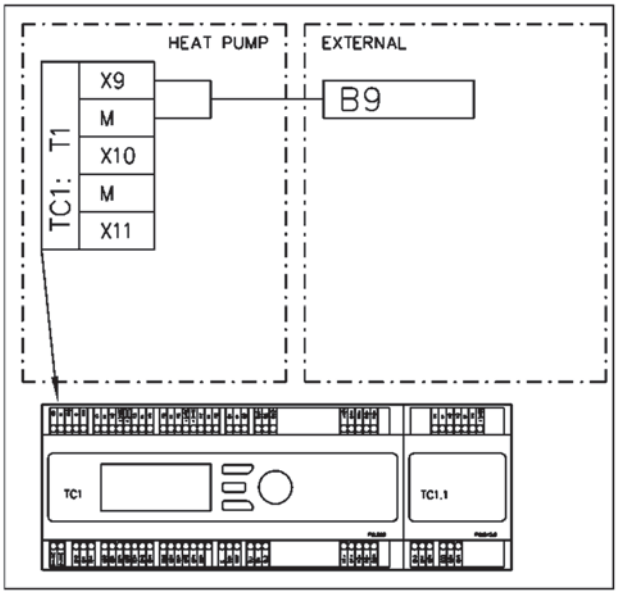
8.3 Connecting the sensors

Connect the sensors according to the instructions below before starting up the heat pump. The sensors are delivered in the manual folder. The sensors have position markings. Connect the sensors to the heat pump's controller. The controller is in the control unit behind the cover plate.

Outdoor temperature sensor (B9)

Place the sensor in a shaded location on a wall facing north or north-east. The sensor must not be installed near windows or doors.

Connect the outdoor temperature sensor (B9) to the T1 connectors X9 and M on the controller.

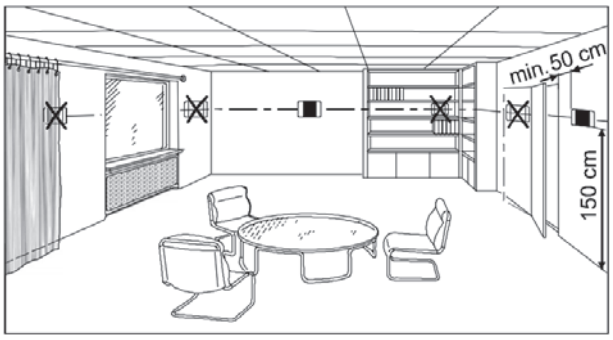


Room temperature sensor (B5)

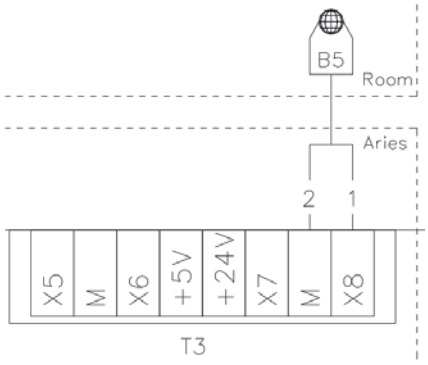
Place the room temperature sensor in a central location in the residential space. The room temperature sensor must be connected to the controller before the heat pump is started up.

The room temperature sensor measures the room temperature, which is displayed on the heat pump's user interface, and it also regulates the room temperature. The impact of the room temperature sensor on the indoor temperature can be adjusted on the user interface.

Room temperature sensor placement:



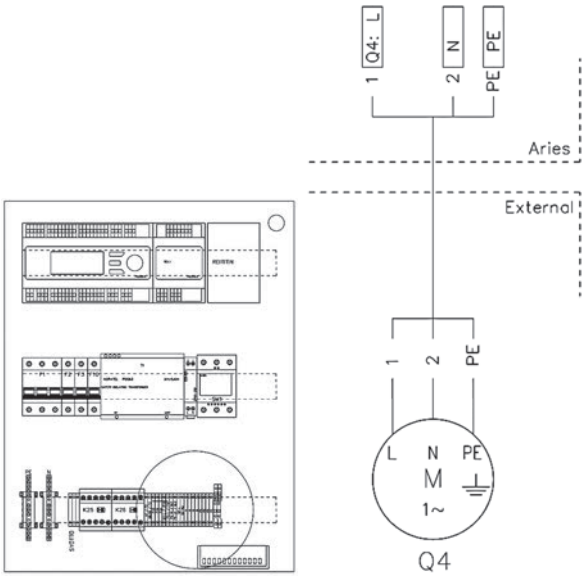
Connect the room temperature sensor (B5) to the T3 connectors X8 and M on the controller.



8.4 Connecting the domestic hot water circulator pump

The domestic hot water circulator pump (Q4) can be connected to the controller's electrical control. According to the factory settings, the water circulator pump operates whenever the domestic hot water operating method is in the ON state. The circulator pump's control method can be adjusted so that it operates according to a schedule. The adjustment can be made using the heat pump's user interface.

NOTE: The maximum load current on the relay output is 1.5 A (230 V AC)



The water circulator pump is connected to terminal strips Q4:L, N, PE on the control unit.

8.5 Continuous alert

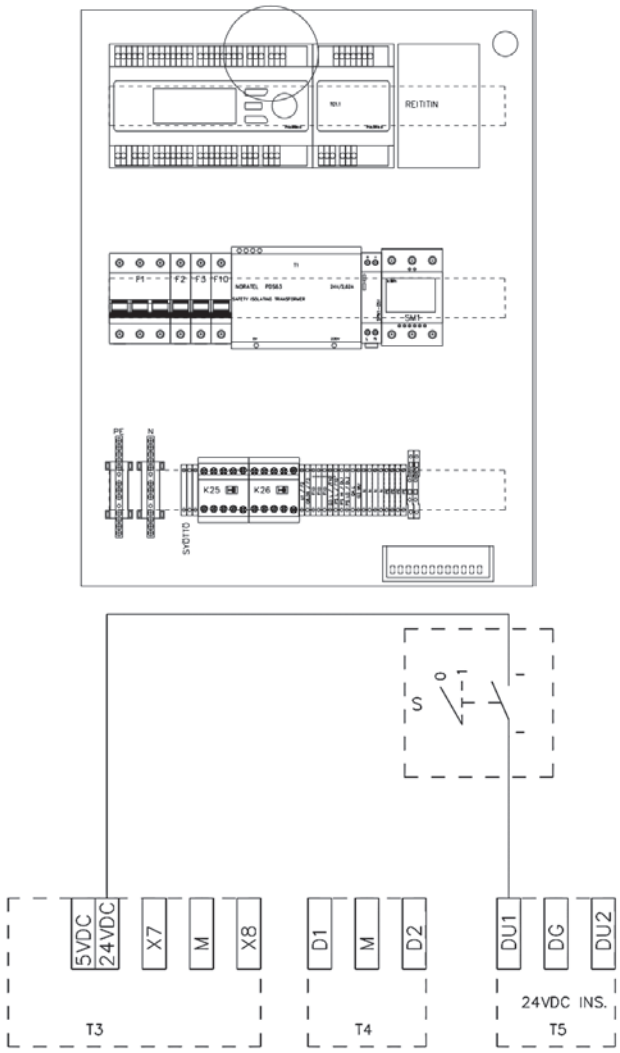
The heat pump can provide a continuous alert in the event of failures. The continuous alert is connected to the controller's potential-free relay, K10. Use a 2-pole cable with a cross-sectional area of at least 0.5 mm^2.

The controller uses indicator lights to show whether it is functioning correctly and communicate alerts. The device is functioning correctly when the green light is on. If the red light is on, the device is in the alert state.

8.6 External control to the source pump

The source pump can be started up using external potential-free contact terminal information. The contact terminal information is connected to the controller connections T3, +24V and T5, DU1. This function can be used for passive cooling.

Closing the contact terminal starts up the source pump inside the heat pump.



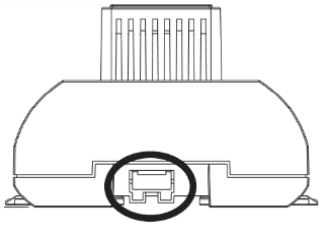
8.7 Connecting accessories

The connection instructions for accessories are included in the installation instructions supplied with each product.

8.8 Connecting an expansion card

Accessories that require an expansion module should be connected to the controller using a connector or cable attached to the end of the module. First attach the connector to the expansion module before attaching the expansion module to the DIN rail. When the module is attached to the DIN rail, push the connector into the controller. The protective plastic in front of the connector must be removed from the controller before installation.

Connection at the end of the controller



8.9 Heating control group (accessory)

The heating control group is an accessory available for the Aries heat pump, enabling a second heating circuit to be controlled. The heating control group is delivered separately, in a separate product package. The heating control group includes a controller expansion card and a factory-assembled mixing group.

Install the heating control group according to the instructions supplied with the product.

9 FILLING

9.1 Filling the heating and domestic hot water side

The coil in the heat pump's tank contains water for the heating system.

- Fill the tank coil and the heating circuit using the filling valve for the house's heating system.
- Purge the system of air thoroughly.
- Make sure that the system is at the correct pressure to function. When filling, the pressure should be approximately 0.5 bar. When the tank heats up, the pressure should be 0.5–1.0 bar. Check the pressure as the tank heats up.

It is not necessary to purge the air of the domestic hot water tank after filling. Air will exit the tank as the domestic hot water is used.

9.2 Filling the collector

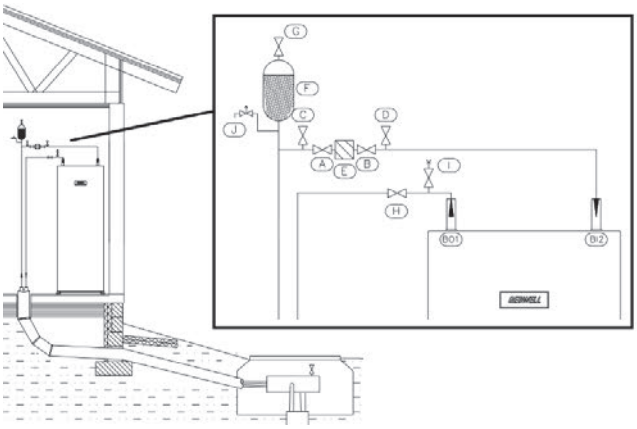
Fill the collector with a mixture of water and geothermal fluid that can withstand a temperature of -15°C. Environmentally friendly bioethanol is recommended for use as a geothermal fluid.

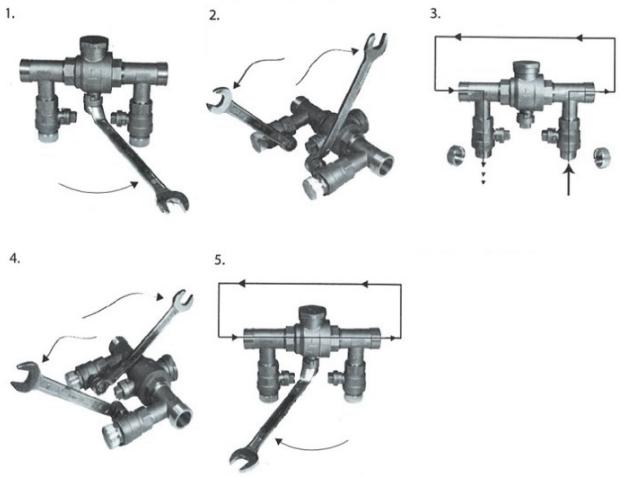
The collector should be filled via level tank F as shown in the diagram. If the circuit is filled using a pump, microbubbles are created, and these dissipate slowly, causing underpressure alerts. For this reason, it is advisable to fill the collector slowly.

The collection pipes for the collector should be installed in such a way that air is able to escape from the collector's level tank via valve G. The expansion tank must therefore be located at the highest point, and the collection pipes must not allow air pockets to form.

There is enough fluid in the collector when the fluid pressure in the expansion tank is between 1/3 and 2/3.

Check strainer E by first closing valves A and B and opening the filter cover. After cleaning the filter, first open valve A, which will release the air from the filter chamber into the expansion tank, F. Open valve B.





9.3 Pressurising the collector

Pressurise the collector using an external booster pump. Connect the pump and the return hose to valves C and D as shown in the diagram. Use a strong hose or pipe with a diameter of at least 30 mm. Close valve A while you increase the pressure in the collector. Make sure that no debris from the base of the container passes into the suction hose. Keep an eye on collector pressure gauge I. The pressure must not exceed 2 bar.

9.4 Pressure-test of the collector

A pressure test should be performed on the filled collector as follows: increase the pressure to 2 bar and check the pressure after half an hour. If the pressure drops over half an hour, there is a leak in the system. Repair any leaks and repeat the pressure test. Mark the pressure test as complete in the *Installation record* when the pressure test is successful.

10 CHECK-UPS BEFORE STARTING THE HEAT PUMP

When the heat pump is delivered, all of the operational switches will be in the “OFF” position.

The power supply plug PT (32A) is the heat pump’s main switch.

Before starting up the heat pump, ensure that:

- the collector has been filled with liquid
- the heat pump’s tank (LVV1) has been filled from the heating and domestic hot water side
- the coil of the tank (LVV1) has been vented thoroughly
- the outdoor temperature sensor is connected
- the room temperature sensor is connected
- the heating sensors are attached (if used as an accessory)
- the electrical connections are correct

Aries heat pump can be started up either from the operator unit of the heat pump or from the Gebwell Smart UI application.

11 STARTING UP THE HEAT PUMP FROM THE OPERATOR UNIT

- Put the heat pump’s plug socket (PT) into an electrical outlet.
- Put the controller’s line protector F10 in the “ON”(I-position).
- Put the frequency converter’s line protector F2 in the “ON” position.
- Put the charge and collection pump’s line protector F3 in the “ON” position.
- Put the electric heater’s F1.1 and F2.2 switches in the “ON” position.
- Set the controller’s operating mode to ***OP.MODE HMI*** >> **AUTO**. To change the settings, press and hold the roll switch for 3 seconds and set the commissioning code: 2000 _ Factory setting: STOP
- The heat pump will start up the charge and collection pump’s pre-operation cycle, and it will switch the change-over valve into the domestic hot water charge position.
- The compressor will start up automatically.
- Begin entering the settings for the building.

11.1 Purging the air from the accumulator coil

The heating system water circulates in the heat transfer coil inside the accumulator. The coil should be carefully purged of air during deployment to ensure the correct operation of the device. Air trapped in the coil will cause malfunctions.

Once the device has been started, you can purge the coil using the user terminal by electronically turning the change-over valve.

1. Go to MAIN MENU -> press roller
2. Go to SERVICE MENU -> press roller for 3 seconds
3. Enter the code 2000 in LIST to enter the menu
4. Go to TEST FUNCTIONS -> press roller

In the *Service Menu*, you can drive the charging pumps electronically at different speeds to remove the air from the system. You can remove the air from the charging coil by toggling the change-over valve ON/OFF a few times.

CHANGE-OVER VALVE: AUTO/ON/OFF

AUTO = factory setting > automatically turns the valve according to the heating needs

ON = valve position A > flow to the domestic water accumulator’s charging coil

OFF = valve position B > flow to the heating systemFEED PUMP: AUTO/0–100%

AUTO = factory setting > the regulator regulates the pump in accordance with the domestic water and heating settings

0–100% = you can electronically increase the pump speed to facilitate airing

NB! REMEMBER TO SET ALL TESTS TO ‘AUTO’ AT THE END OF THE TEST.

IF A FUNCTION IS SET TO ELECTRONIC MANUAL MODE, THE DEVICE WON’T WORK PROPERLY.

12 STARTING UP FROM GEBWELL SMART APPLICATION

12.1 Downloading the Gebwell Smart app

The Gebwell Smart app can be installed on a smartphone and used to control the Aries heat pump. The Gebwell Smart app is available for Android and iOS operating systems. Download the app on the Google Play store for Android devices and the App Store for iOS devices.

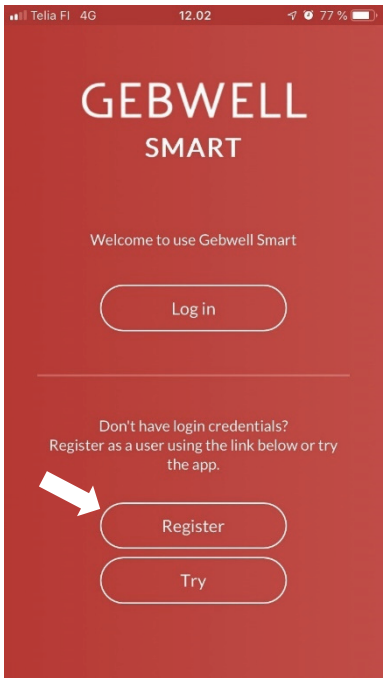
The app is named Gebwell Smart.

NOTE! Some features of the Aries heat pump require a mobile data connection (such as 3G or 4G). If Aries is installed in a location with poor or non-existent mobile data coverage, Gebwell cannot guarantee the proper operation of all the features (such as remote access).

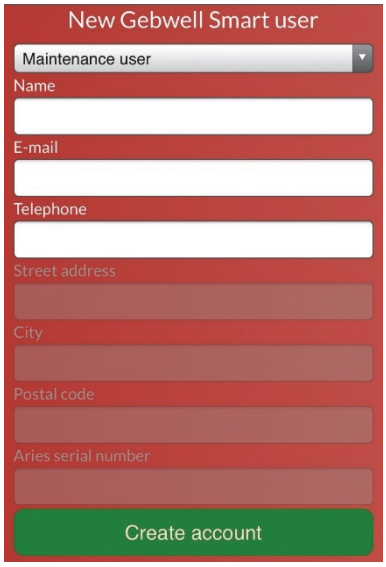
Gebwell is not be responsible for the operation of mobile data, and if you want to improve it by using amplifiers, for example, Gebwell is not responsible for the resulting costs.

12.2 Obtaining maintenance rights

Open the Gebwell Smart application and choose '*Register*'.



The registration form opens in browser. Choose '*Maintenance user*' as user level. Fill in your contact information and select '*Create account*'.

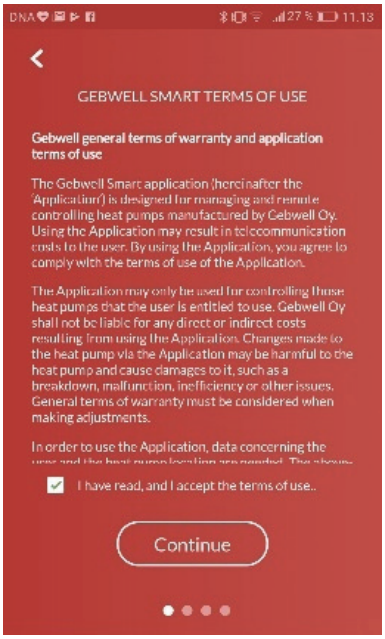


The password will be sent to the e-mail address you gave when registering. The e-mail address is also your username. *NOTE! Please check the spam if you cannot find the e-mail in Inbox.*

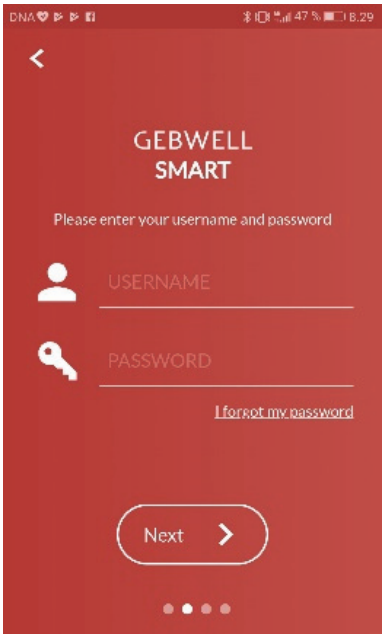
NOTE! By using a maintenance ID and password, you can control the heat pump while in the coverage area of its Wi-Fi. In addition, some of the application features (such as Measurements and Domestic water temperature settings) require the remote access service. For the above reason, we recommend you ask the owner of Aries to include you as an additional user for the owner's ground source heat pump. This way you can, if so required, check the status of Aries also through a remote connection, if the customer has activated the Remote access service.

12.3 Logging into the application

Re-open the application and read and accept the terms of use.

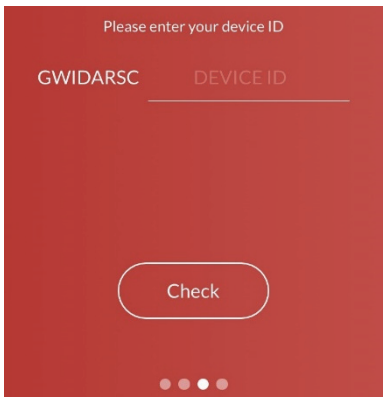


Enter your username and password and select '*Next*'.

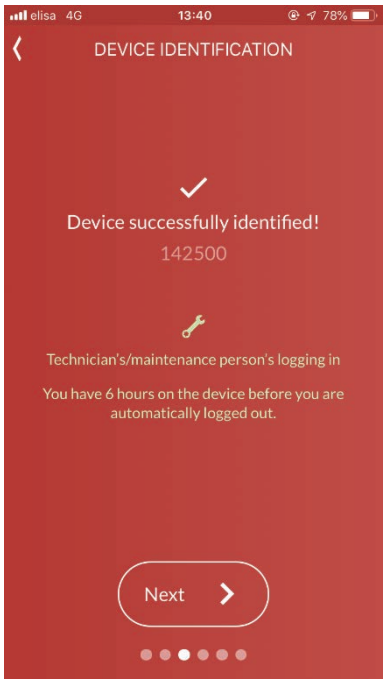


12.4 Device identification

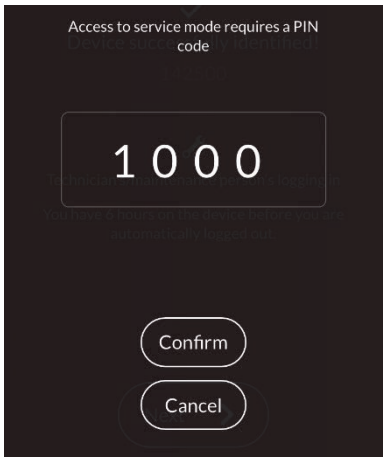
On device identification screen enter the serial number (Device ID) of the Aries heat pump you are activating. The number can be found on the ID plate attached on the control centre cover panel behind the front door and on the back cover of the user manual (see example of the plate on next page).



If the serial number is correct, you will get the following message. Choose '*Next*'.



Next you are asked to enter the "*PIN code*", which is **1000**.



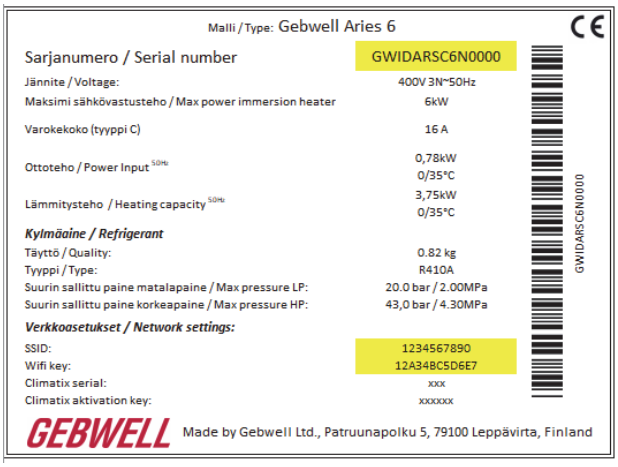
12.5 Connecting to the heat pump's Wi-Fi network

In order to gain access to the Aries heat pump via application you are to connect to the heat pump's Wi-Fi network.

Below is an example of the heat pump's ID plate, on which you find the *SSID* and *Wifi key*, which are needed when entering the Wi-fi settings on your smart device.

The Wi-fi settings have to be entered on your smart device so that you can connect to the heat pump's network and start-up the heat pump via application.

On the label you also find the heat pump's *serial number* which you need identify the device when logging into the application.



ID plate attached on the control centre cover panel behind the front door and on the back cover of the user manual.

12.6 Entering heat pump's Wi-fi settings on smart device

Enter the Wi-Fi settings on your smart device

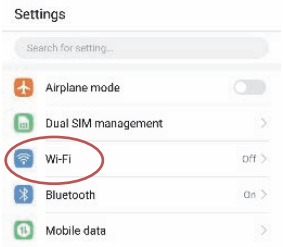
Settings menus differ from smart device to another, so these instructions may not apply to every device.

The Wi-Fi settings must be entered manually because the heat pump's network is hidden for security reasons, so your smart device will not automatically show it on the list of available networks.

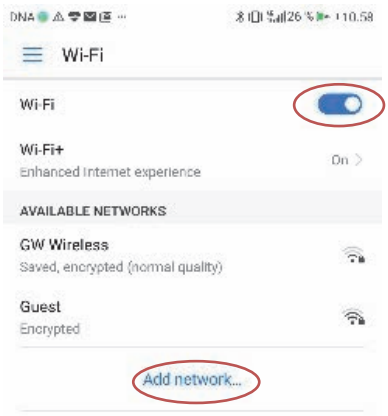
⚠ *NOTE! Switch off all the network connections on your smart device (mobile data and Wi-Fi networks).*

Open smart device's settings menu and the Wi-Fi settings.

Android: Turn on Wi-Fi (switch in the '*On*' position)



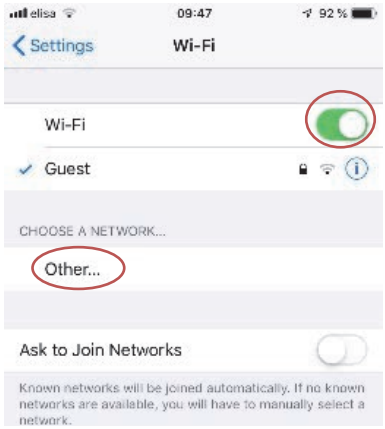
Select "*Add network*"



Select '*Security*' and choose '*WPA/WPA2*'. Enter the network name and password. These details are shown on the ID plate on the control centre's cover plate and on the back cover of the user manual (Network name: SSID, password: Wi-Fi Key).

Select '*Connect*'

iOS: Turn on Wi-Fi (switch in the '*On*' position) and select '*Other…*' under '*Choose a network*'.

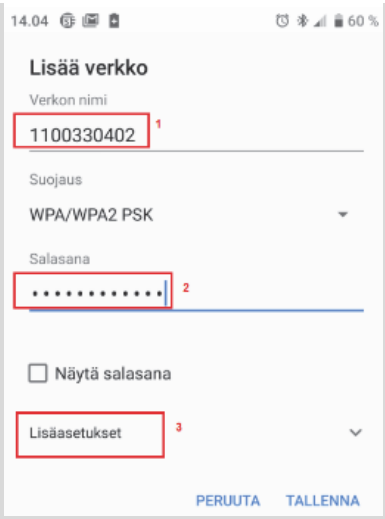


iOS: Select '*Security*' and choose '*WPA2*'. Enter the network name and password. These details are shown on the model sticker on the inner side of the heat pump's door (Network name: SSID, password: Wi-Fi Key).

Select '*Join*'.

NOTE! On newest Android smart devices with the operating system version 9, also the following actions are to be made when entering Wi-Fi settings on the device:

Once you have entered the Network name/ SSID (1) and security settings and the Password/Wifi key (2), choose '*Additional settings*' *(3).*



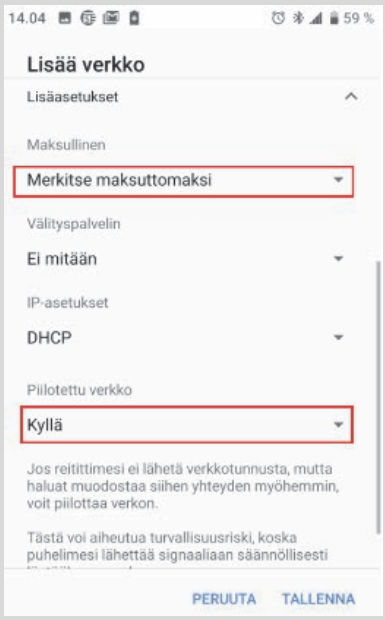
Do the following changes on Additional settings:

'Mark as free of charge'

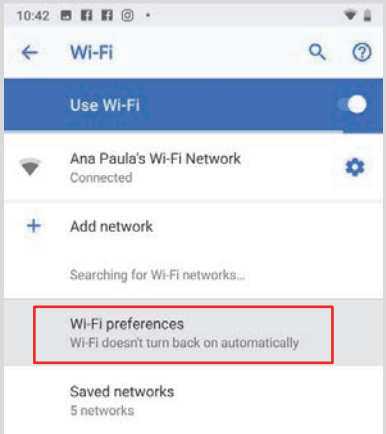
and

Select *'Yes'* on Hidden network

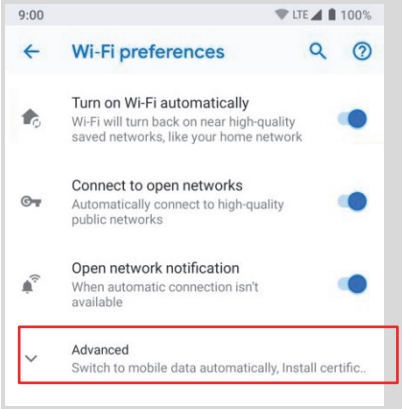
and *'Save'*



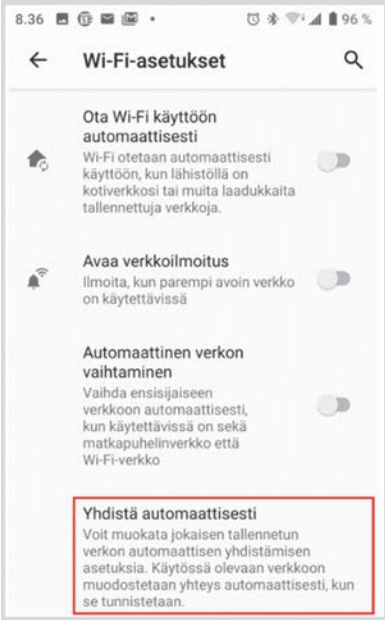
Go to front page of Wi-Fi settings and choose '*Wi-Fi preferences*'



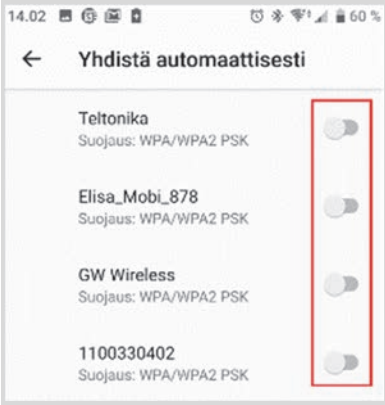
Open menu '*Advanced*'



Open menu *"Connect automatically"*

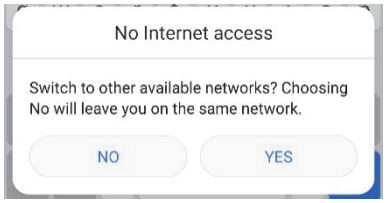


Turn off the automatic connection to Wi-Fi networks on your smart device (turn the sliders '*off*')



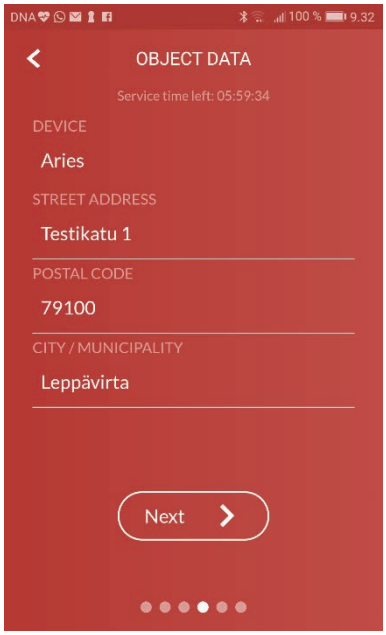
NOTE! Once you have connected your smart device to Aries heat pump's Wifi network, there is no internet connection on your smart device (connection to Aries Wifi and mobile data cannot be simultaneously on).

As your device notifies of missing internet connection and suggest switching to other available network, choose NO, so that the connection to Aries Wifi remains.

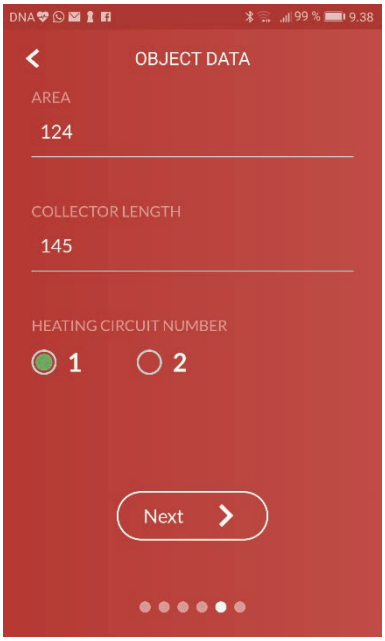


12.7 Device testing and heat pump commissioning

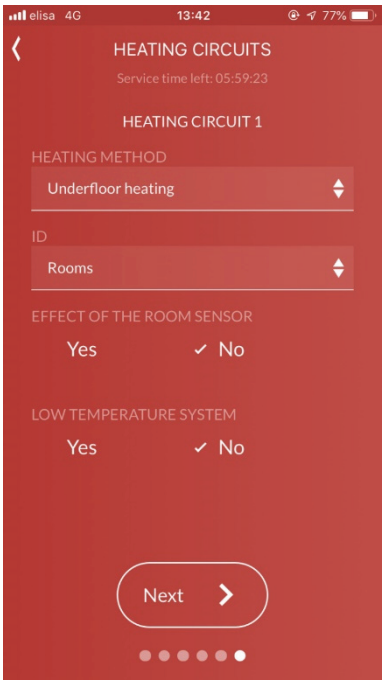
Open the app window and enter *the address*, where the Aries heat pump is located.



Then enter the data of the house: area, *collector length* and *number of heating circuits*.

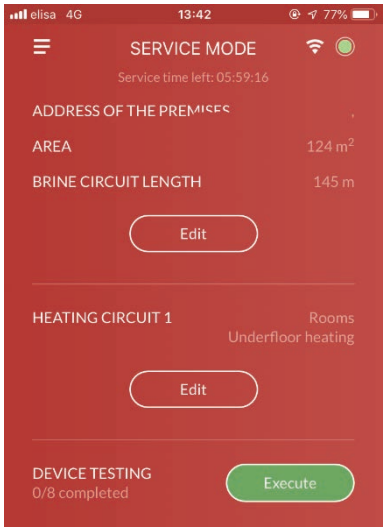


Fill in *Heating method* and *ID* for heating circuits by choosing from the drop-down menu.



Check that the information you entered is correct (you can edit the information by choosing *Edit*).

Open device testing check list by choosing *Execute*



Room sensor effect: select Yes, if the heating circuit has a room sensor.

Low-temperature system - The selection affects, together with the heating method (floor/radiator heating) the set values of the heating curve and supply water. The tables below show set values for different heating methods.

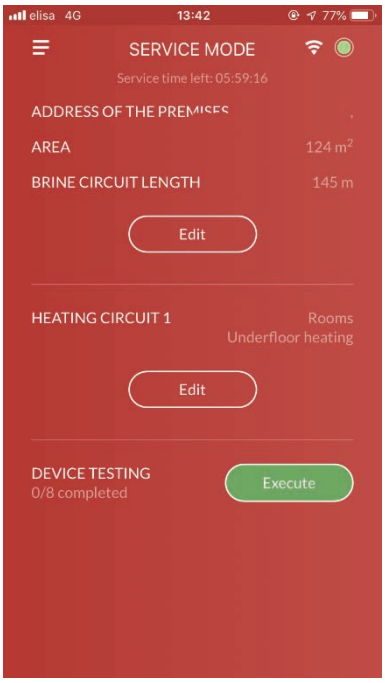
Heating method: Underfloor heating

	Low temperature heating system	
	Yes	**No**
Heating curve		
Y1	40°C	45°C
Y2	35°C	38°C
Y3	28°C	32°C
Y4	25°C	27°C
Y5	20°C	20°C
Supply water set value		
Minimum	18°C	18°C
Maksimum	40°C	45°C

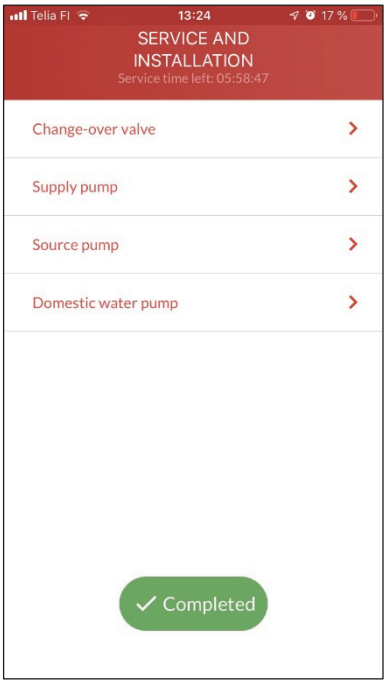
Heating method: Radiator heating

	Low temperature heating system	
	Yes	**No**
Heating curve		
Y1	50°C	65°C
Y2	42°C	55°C
Y3	35°C	45°C
Y4	28°C	40°C
Y5	18°C	18°C
Supply water set value		
Minimum	15°C	15°C
Maksimum	50°C	65°C

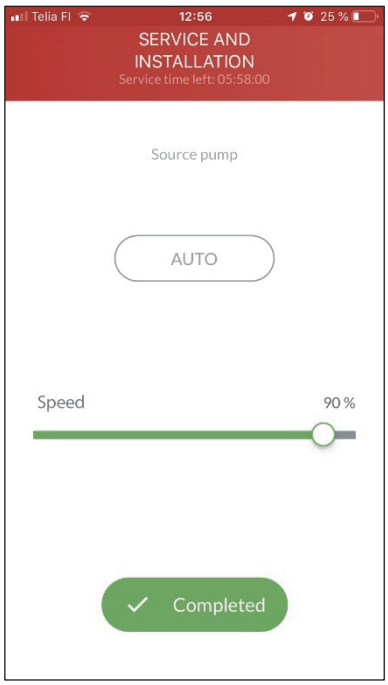
The next screen has a summary of the details of the property and system you have entered. Check that the information is correct (and *Edit* if needed). Start Device testing by choosing *Execute*.



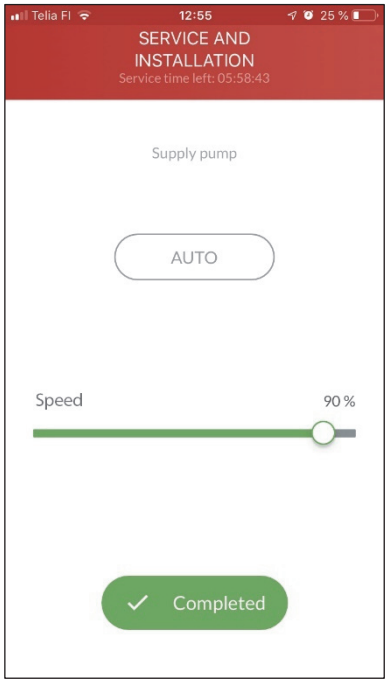
When testing the device, you can finalise the venting of the domestic water circuit and vent the charging circuit. This is easy to achieve by electrically changing the position of the change-over valve.



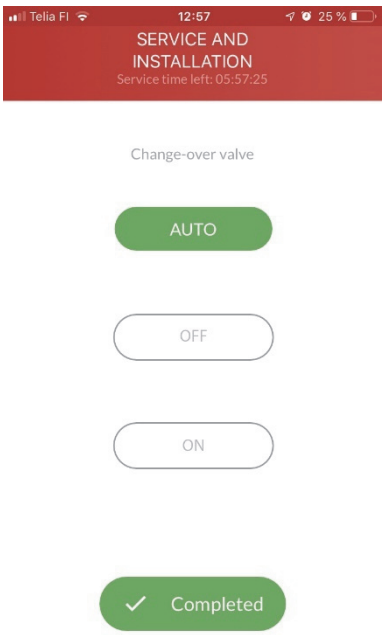
Start the source pump by setting the speed e.g. to 90%.



Start the supply pump (charge pump) by setting the speed e.g. to 90%.

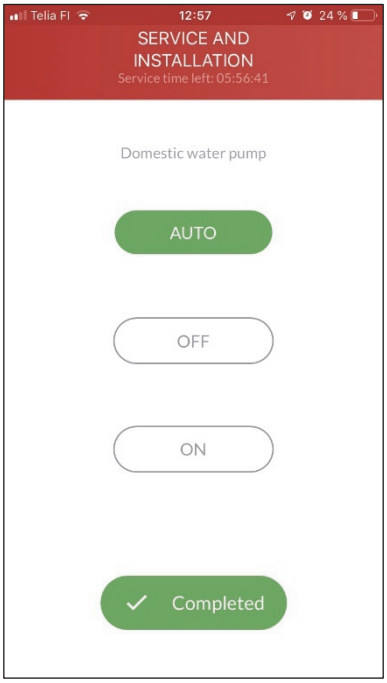


Change the position of the change-over valve between *OFF* and *ON*. The air within the system moves from the charging coil of the tank to the heating system and exits through the air vents. Venting is completed when gurgle of water, suggesting the presence of air, can no longer be heard from the heat pump.



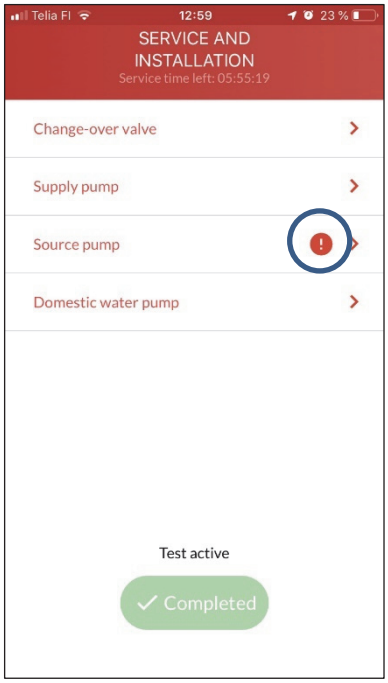
Finally, reset the Change-over valve, Charging pump, and Collecting pump to the *AUTO mode.*

Check the operation of the Circulator pump. By selecting *ON* the circulator pump should start up. Finally, reset the *AUTO* mode.



In the top right corner of the screen, an icon for device testing appears. When device testing is active, the icon rotates. The icon is stationary when device testing is not active.

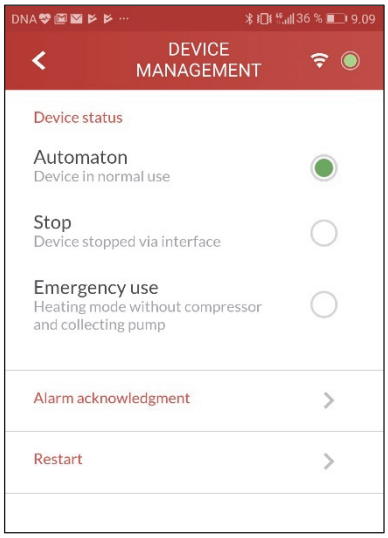
In the device testing screen, the Red exclamation mark appearing at the heat pump component indicates that the testing in question is in progress.



After completing device test, go to main menu and choose *Settings* and on settings menu open *Device management.*

The device is on *Stop* as operationmode. Choose *Automatic* as operation mode. In case there is a need to run the heat pump before the collector is connected, choose *Emergency operation* as operation mode. In this operation mode all the heat is produced by heat pump's electric heater using electicity.

Heat pump starts up and you can log out from the application.



12.8 Settings - heating

In the *Heating* submenu of the *Settings* menu, you can adjust the adjustment curve of heating, modify the set values of the different heating modes (normal and lowered), as well as the threshold limits of the set values for the temperature of supply water of heating. Here you can also deactivate (OFF) the summer stop feature, if so required. If there are heated spaces in the system, in which heating is preferably on also in summer time (bathrooms), the summer stop feature of the circuit in question has to be turned off.

The factory setting for the summer stop feature is 16°C.

12.9 Settings - domestic water

In the *Domestic water settings* of the *Settings* menu, you can modify the Legionella feature settings:

- temperature to which the heat pump charges the tank temperature (factory setting 55°C) and
- time when the cleaning is performed

The modification of the various settings (eco, normal, and comfort) of the domestic water tank requires an internet connection, which means that they cannot be modified in the service mode of the heat pump, which operates through the Wi-Fi connection of the heat pump.

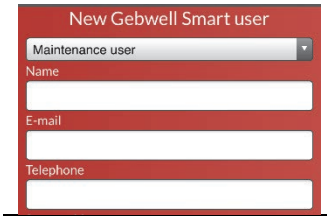
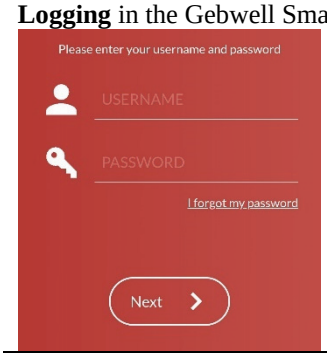
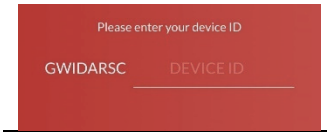
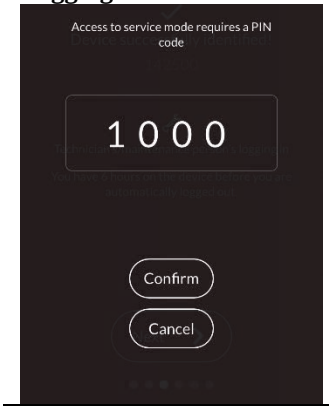
It should be noted in the set values of the domestic water tank that the temperature of domestic water exiting the heat pump is approximately 5 to 8 degrees warmer than the set value of the domestic water tank. If the set values are, for example, Eco 47, Normal 50, and Comfort, the temperature of domestic water is respectively approximately 55, 58, and 60 degrees. *If the domestic water tank is set to a temperature higher than 55 degrees, the final heating of domestic water takes place with an electric element.*

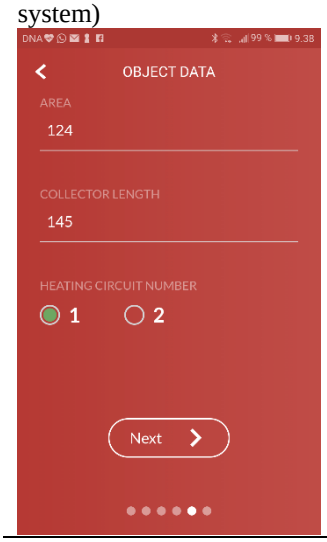
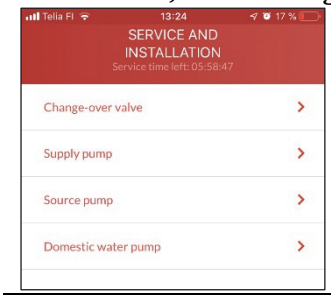
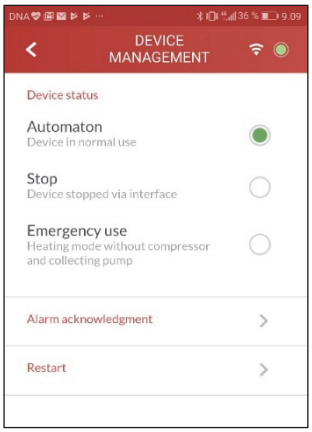
When you have completed the settings to your liking, you can log out of the application.

12.10 Wi-Fi connection or mobile data

Logging in the commissioning and service mode of the application is possible only through Aries heat pump's own Wi-Fi. The table below shows at what stage of commissioning/servicing the smart device must be connected to the internet and at what stage the device must be connected to the *Aries Wi-Fi*.

On some smart devices, the internet connection (mobile network or WLAN) has to be deactivated for the device to connect to Wi-Fi.

	Internet connection (mobilenet work/ mobile data)	**Aries heatpump WLAN** (Wifi)
Downloading the Gebwell Smart application on an Android or iOS device from the application store 	X	
Registering as a user of the Gebwell Smart application 	X	
Switch off the internet connection (mobile data) of the smart device and connect to the Wi-Fi network of the Aries heat pump (entering the Wi-Fi settings, see user manual section 12.6) The connection may take a while to establish.		
Logging in the Gebwell Smart application 		X
Device identification 		X
Logging in the Service mode (PIN code 1000) 		X

	Internet connection (mobilenet work/ mobile data)	**Aries heatpump WLAN** (Wifi)
Service mode, site details (details of the premises and system) 		X
Service mode, device testing 		X
Service mode, Device management > **Starting the heat pump** 		X

12.12 Operation without the collector and operating during construction

The heat pump can be used for heating before the collector is connected. All of the heat will be generated by the heat pump's electric heater using electricity. However, all of the control functions for heating and domestic hot water are available. Note that the heating and domestic hot water circuits should be connected and vented, and that the electrical connections should be completely ready for use.

If the heat pump is to be used for heating during construction, the device should be set to "Emergency operation" mode to ensure that the compressor (K1) and the source pump (Q8) do not start up. This ensures that the heat pump uses the electric heater (SV1) for domestic hot water and heating.

12.13 Purging the collector

The collector must be purged of air with extreme care. If there is even a small amount of air in the collector, the device will not operate optimally and may malfunction.

Purging the charge and collector

- Put the line protection switch for the charge and pumps (Q9 and Q8) into the "ON" position.
- The controller's line protection switch (F10) should be in the "OFF" position.
- Allow the pumps to operate for a moment, and then turn them off.
- The air will begin moving and it will escape from the air vents. If necessary, open the air venting valves.
- Check that the charge and collector has a pressure of 1–1.5 bar.
- Repeat this procedure until the circuits make no trickling/bubbling sounds, or other noises indicating the presence of air.

13 HEAT PUMP SETTINGS

Some of the settings can only be configured at the expert level. If you are unable to access a setting, press the knob for 3 seconds and set the code 2000. When changing settings, you should understand their impact.

13.1 HEAT PUMP

►Time and date

The controller has an annual schedule with the time of day, day of the week and date. To ensure that the heating programme functions correctly, the time and date must be set correctly. The heat pump will not start until the time and date have been set.

The time can be set on the controller menu by selecting MAIN MENU > HEAT PUMP > SYSTEM CLOCK.

Month / Day / Hour / Minute / Second

►Language selection

By default, the heat pump's language is Finnish. Several language options are available for the user terminal. You can change the language by selecting MAIN MENU > HEAT PUMP > LANGUAGE SELECTION.

Language options:

English, Swedish, Finnish

►Heat pump operating mode

The heat pump is started/switched off using the ***HEAT PUMP OPERATING MODE*** setting. In factory delivery, the device is in ***OFF*** mode. When the operating mode is set to ***AUTO***, the device starts. The device starts automatically and starts heating the domestic hot water and heating according to the heat request.

MAIN MENU > HEAT PUMP > OPERATING MODE

Options: AUTO/OFF***

**** NOTE! To change this setting, you must be in the service mode. To enter service mode, press the knob for 3 seconds and set the code 2000.*

►Acknowledgement of alerts

If the device shows an active alert, you can reset it under *Acknowledgement of alerts*. Determine and correct the cause of the alert before you reset it.

13.2 DOMESTIC HOT WATER

Domestic water is prepared with a heat pump and its change-over valve control. When the domestic water request is activated, the change-over valve turns to domestic water accumulator and charging starts. The heat pump charges the domestic water to the setpoint and returns to the heating position. If heating is active, the charging continues to heat the property.

The domestic water accumulator has two temperature sensors, of which B2 is measuring and B3 is the control sensor. B2 is located at the top of the domestic water accumulator and B3 is located in the middle or below. The heat pump prepares domestic water based on the accumulator's measurement B3.

B3 is the sensor controlling domestic water, and it starts and turns off charging. Charging hysteresis and the setpoint of domestic water influence the starting process. The charging of domestic water is started when the B3 measurement is below the value:

Setpoint – (minus) *Charging hysteresis*

Charging ends when the setpoint is reached.

Status

Indicates the charging status of domestic hot water

Domestic water operating mode

indicates the selected operating mode

Tank's upper temperature

indicates the upper temperature of the domestic water accumulator

Tank's lower temperature

indicates the lower temperature of the domestic water accumulator

Change-over valve

indicates the control position of the change-over valve

Circulator pump

indicates the status of the domestic water circulator pump

►Domestic water setpoints

From the setpoints, a functional stop point is selected for different operating modes of domestic water.

In Auto mode, the device works as a factory setting with the COMFORT setting. If time controls are used, the controller changes the operating mode of the domestic water between the COMFORT and ECO modes.

Comfort = basic level of domestic water

ECO = reduced level of domestic water

►Legionella function

The anti-bacterial function of domestic hot water. The Legionella function raises the domestic water accumulator temperature to the Legionella setpoint once a week. The heat pump uses an electric heater for Legionella charging. The function should be performed when there is presumed to be no load in the domestic water.

Setpoint temperature:

The setpoint to which the heat pump will charge the accumulator temperature.

Factory setting 55°C

Legionella function:

The weekday when the charging takes place.

Mon/Tue/Wed/Thu/Fri/Sat/Sun

Start-up time:

The time of day when the Legionella function starts

13.3 HEATING CIRCUIT 1/2/3

The heating system is configured circuit-specifically. The heat pump controller is capable of controlling two heating circuits. Heating circuit 1 is always the pump heating circuit for which a mixing function cannot be configured. An external circulator pump can be installed into the heating circuit 1 for controller control. Heating circuit 2–3 is an optional mixing heating circuit that can be used to adjust a lower temperature. If you use two or three heating circuits, circuit 1 should always have the higher temperature.

Heating circuit status

indicates the status of the heating circuit

►Setpoint room temperature

The room temperature can be controlled according to the room setpoint. The room sensor must be placed in a central part of the building in order for adjustment to function optimally.

The controller uses ***COMFORT*** for normal heat control and ***ECO*** for the time control drop period.

If the heating circuit does not include a room sensor, you should disable the room sensor in the Service Menu. In this case, the controller will use a 20-degree reference value for heat control.

Current

indicates the current room temperature setpoint of the heating circuit

Room effect

indicates the compensation effect of the room temperature sensor on the supply water temperature

►Comfort = basic heating level

►ECO = reduced heating level

►Room temperature sensor compensation

The room temperature sensor compensation is affected by a deviation between the setpoint and measured room temperature. The compensation affects the setpoint of the supply water.

This setting determines the effect of room temperature sensor compensation on the regulation of heat in the property. The higher the value, the greater the effect. By setting the effect to 0, the room temperature sensor acts only as a measuring sensor and does not affect the control of supply water.

►Heating curve

The heating curve is used to calculate the setpoint for the supply water temperature, and this setpoint is used to adjust the supply water temperature according to the prevailing weather conditions. The curve can be changed at five different outdoor temperature points so that the heating output and room temperature can be adjusted as required.

Outdoor temperature values:

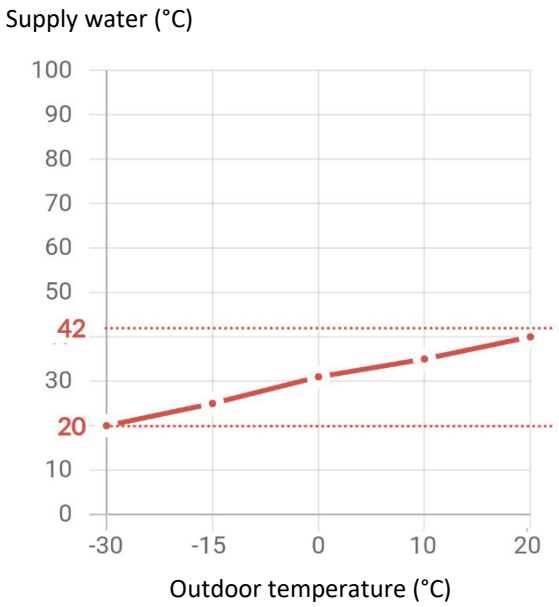
Y1 = -30°C

Y2 = -15°C

Y3 = 0°C

Y4 = 10°C

Y5 = 20°C



►Setpoint supply water

You should set permitted supply water limits for the heating circuits. The supply water set values are cut at the minimum and maximum set values, even if the heating graph were to exceed the set point.

If you use underfloor heating to heat wet rooms, please note the minimum temperature increase when setting the lower limit.

Current value

indicates the supply water temperature

►Upper limit:

Maximum supply water temperature

Set point values:

Underfloor heating 40–45°C

Radiator heating 50–70°C

►Lower limit:

Minimum supply water temperature

Set point values:

Underfloor heating 18–25°C

Radiator heating 15–18°C

►Summer/winter change threshold

The summer/winter heating threshold switches the heating on or off according to outdoor temperature conditions. When heating is set to AUTO, this cross-connection functions automatically, and the user does not need to switch the heating on or off. The annual periods can be shortened or extended by adjusting the set values.

NOTE: If the system has heating areas that should not be stopped in the summer (humid areas), the setting for the circuit in question should be changed to a continuous WINTER state.

Factory setting 16°C

►Weekly calendar

In the weekly calendar, you can set time control for heating. In time control, the heating circuit changes the mode between the COMFORT and ECO modes. Please note that there is a delay in changing temperatures, and time control does not work on all systems.

13.4 COOLING CIRCUIT

The heat pump controller can control one mixing cooling circuit.

►Operating mode

To the weekly calendar

►Setting value

To the weekly calendar

►Cooling curve

The cooling curve is used to calculate the setpoint for the supply water temperature, and this setpoint is used to adjust the supply water temperature according to the prevailing weather conditions. The curve can be changed at five different outdoor temperature points.

Outdoor temperature values:

Y1 = +15

Y2 = +20

Y3 = +25

Y4 = +30

Y5 = +35

►Setpoint supply water temperature

When setting thresholds, check the thresholds for the cooling device. Too cold supply water could cause condensation in piping or equipment.

►Upper limit:

Maximum supply water temperature

►Lower limit:

Minimum supply water temperature

13.5 SERVICE MENU

You can access the service menu by logging in to the expert level. Press the knob for 3 seconds and log in with code 2000.

Menu: Main menu > Service menu > Device settings

CHARGE CIRCUIT

►Charge temperature difference

Set the temperature difference (dt) of the condenser between the supply and the return water sensors.

Factory setting: 5.0 K

Allowed thresholds: 4 to 15 K

Examples of values:

Underfloor heating: 5 K

Radiator heating: 7 to 10 K

Accumulator charge 7 to 10 K

►Minimum speed of the charge pump

Set the condenser's circulator pump a minimum speed below which the speed does not decrease during charging.

Factory setting: 40%

Allowed thresholds: 20–60%

►Maximum speed of the charge pump

Set the condenser's circulator pump a maximum speed above which the speed does not increase during charging.

Factory setting: 100%

Allowed thresholds: 70–100%

COLLECTOR

►Minimum speed of the source pump

Set the collector's circulator pump a minimum speed below which the speed does not decrease during charging.

Factory setting: 40%

Allowed thresholds: 20–70%

►Maximum speed of the source pump

Set the collector's circulator pump a maximum speed above which the speed does not increase during charging.

Factory setting: 100%

Allowed thresholds: 70–100%

►Free cooling

Set the collector's circulator pump a speed setting for free cooling situations. Free cooling is activated using external contact information.

Factory setting: 100%

Allowed thresholds: 20–100%

ELECTRIC HEATER (internal supply water electric heater)

Operating mode

indicates the operating mode of the electric heater

►Collector's temperature limit for electric heater operation

Set a threshold for the measurement (B91) coming to the collector, in which case the electric heater will start heating alongside the compressor to protect the collector from freezing.

Factory setting: –4°C

Allowed thresholds: set based on the application

►On, sequence 1

Setting the release of the first sequence of the electric heater

►On, sequence 2

Setting the release of the second sequence of the electric heater

►On, sequence 3

Setting the release of the third sequence of the electric heater

►Confirmation (P value)

Setting the P value for capacity calculation

►Integral Time (I time)

Setting the I time for capacity calculation

HEATING CIRCUIT 1/2/3

The settings of the heating circuits are set on a circuit-by-circuit basis for each heating circuit in use.

►Alert limits

The upper and lower limit alerts are set for the supply temperature sensor and the room temperature sensor.

►Summer/winter setting

The settings related to the summer and winter change of the heating circuit are set. The heating circuit goes to the STOP mode in the summer mode and to the HEATING mode in the winter mode. If the heating circuit is intended to be heating all year round, WINTER is selected as the mode.

►Summer/winter mode

Auto/It: automatically switches between the summer and winter modes according to the outdoor temperature time constant.

DATE: changes between the summer and winter modes according to fixed dates.

Summer: fixed in STOP mode

Winter: fixed in HEATING mode

►Summer/winter time constant

A filtered temperature time interval for measuring the change of the heating circuit is set to the heating circuit.

►Start date

A fixed start date is set for the heating season to specify the date on which the heating will enter into the WINTER mode.

►End date

A fixed end date is set for the heating season to specify the date on which the heating will enter into the SUMMER mode.

►Reset outdoor temperature

The filtered outdoor temperature is reset.

►Room temperature sensor compensation

A compensation ratio for the room temperature sensor is set.

The higher the value, the more the deviation between the measured room temperature and the room temperature set-point will affect the supply water temperature.

Room effect

indicates the effect of the room temperature sensor compensation on the supply water temperature.

13.6 WIRELESS SENSORS

An optional wireless indoor temperature measurement system is available to Gebwell's heat pumps. The system includes a Modbus base station and wireless sensors. The sensors can be used to read the temperature and relative humidity of a space. The controller's software currently supports ten (10) sensors.

System activation is done from the commissioning menu.

Main menu > Service menu > Commissioning > Wireless sensors

►Number of wireless sensors

Number of sensors

Factory setting = 0

►Address of the wireless base station

Address of the wireless base station*)

Factory setting = 1

►Baud rate *)

Factory setting = 9,600

►Parity *)

Factory setting = none

►Stop bit *)

Factory setting = one

*) NOTE! Check the Modbus settings of the base station from the installation instructions that come with the system.

The new settings will be applied after the controller is restarted.

14 HEAT PUMP MAINTENANCE AND SERVICING

To ensure the long life and trouble-free operation of your heat pump, the following sections should be checked a few times every year, and more frequently during the first year. Also remember to maintain and inspect accessories in accordance with these instructions.

14.1 Inspections

Remember to remove the plug (PT) from the socket during servicing.

NOTE: The refrigerant circuit must only be serviced by an authorised refrigeration technician.

General appearance and leaks

Check whether there are any visible fluid leaks, oil or anything else that appears abnormal inside and outside the heat pump. It is normal for a small amount of water to drip from the safety valves due to pressure fluctuations.

Heating system

Check the heating system pressure to ensure liquid circulation. The pressure should be 0.8–2.0 bar, depending on the property. Check the correct operating pressure from the INSTALLATION RECORD. If the pressure is too low, add liquid via the network filling valve. If you have to add liquid on a regular basis, please contact the installation or service company.

Collector

Check the amount of fluid in the collector and add fluid if necessary. After commissioning, it may be necessary to add fluid for a few days – a few litres is within the normal range. If the amount of liquid is too low, allow the pump to operate normally, open the collector's filling valve and fill the tank with geothermal fluid. If it is repeatedly necessary to add fluid, contact an installation or servicing company. When the source pump starts up, the fluid level in the tank should decrease slightly. It will then increase correspondingly when the pump shuts off. Any other behaviour is indicative of air in the system, the wrong circulation direction or a blocked filter.

In a pressurised brine circuit, the liquid level should be checked against the brine circuit pressure level. The operating pressure should be 0.5–1.5 bar. If the pressure is lower than that, you should increase the pressure. You can add liquid using a booster pump.

Check and clean the collector's strainer. The filter should be inspected several times immediately after commissioning. However, avoid opening the collector unnecessarily. If the filter is dirty, the brine circuit's temperature difference will increase when the compressor is running, which may cause the device to malfunction.

Inspecting the safety valves

Check the functionality of the safety valves annually by turning the cap. Ensure that water comes out of the overflow pipe.

14.2 Drainage of the hot water tank (LVV1)

The hot water tank (LVV1) is drained by siphoning. Install a drainage valve on the cold water pipe or insert a hose into the cold water connection.

14.3 Drainage of the heating system

Drainage of the heating water from the compressor unit

If the compressor unit requires servicing, the compressor unit's heating system can be drained as follows:

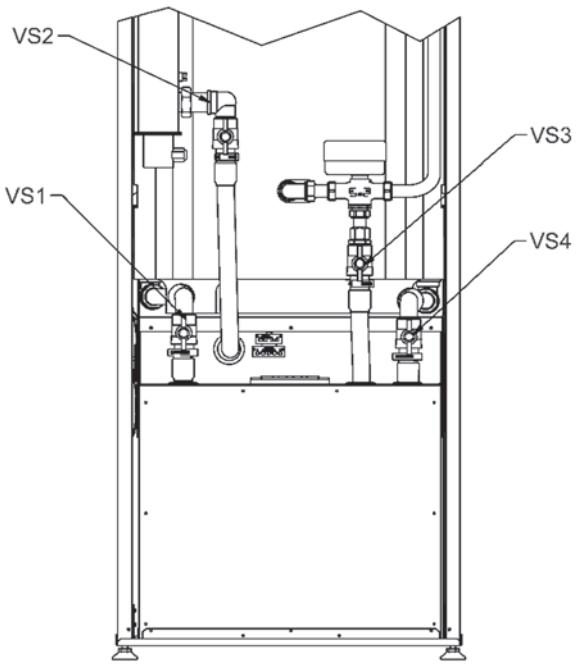
- Close shut-off valves VS1 and VS2
- Open the lowest connectors and allow the liquid inside the compressor unit to drain out
- Loosen shut-off valve VS1 at the connection to allow a small amount of air into the system

14.4 Drainage of the collector

Drainage of the compressor unit's collector

If the compressor unit requires servicing, the compressor unit's collector can be drained as follows:

- Close shut-off valves VS3 and VS4
- Connect a hose to drainage valve VT2 on the lower connector of the evaporator
- Loosen shut-off valve VS3 at the connection to allow a small amount of air into the system



15 FAILURES

In most cases, the controller detects an operating failure and indicates it by showing a failure notification on the display. If a failure notification appears on the display, make a note of the alert in the service log to facilitate any service actions.

15.1 Alerts

When an alert is active, the alert symbol will appear on the heat pump's display.

Open the INFO menu for more information about the alert. Always try to resolve the error yourself using the troubleshooting table first. If you cannot resolve the error, contact an authorised technician.

15.2 Troubleshooting

Follow these instructions if no failures are displayed.

Basic actions:

1. Check all of the connections
2. Check the fuses in the house and the heat pump
3. Check the residual current device

Low room temperature:

- The heat pump is in the wrong operating mode
  - Set the heat pump's heating functions to the correct operating mode.
- Thermostats closed on the radiators/floor heating
  - Open the thermostats in as many rooms as possible
  - Adjust the room temperature in the *Heating area* menu instead of closing the thermostats
- The automation set point is too low
  - Increase the comfort set point on the *Heating area* menu
  - Increase the set point for the gradient of the heating curve on the *Heating area* menu
  - Set the maximum set point for supply water to a sufficiently high value on the *Heating area* menu.
- The heating circuit's time programme is on
  - Go to the *Time programme heating circuit* menu and adjust the time programme
- Air in the heating system
  - Release the air from the heating system
- Closed valves between the accumulator and the heat pipe network
  - Open the valves
- Activated an external contact for decreasing the room temperature
  - Check any external contacts

High room temperature:

- The set values for the heating circuits are too high
  - If the room temperature is only too high during cold weather, decrease the gradient of the heating curve.

- If the room temperature is too high during mild weather, decrease the comfort set value.

Domestic hot water is cold:

- The domestic hot water function is not active.
  - Put the *Operating mode* for domestic hot water in the On state
- Domestic hot water consumption too high
  - Wait until the water warms up. When a temporary period of high consumption begins, you may select forced charging of domestic hot water by pressing the domestic hot water button on the user terminal for 3 seconds.
- Set value too low
  - Go to the *Domestic hot water* menu and increase the set value for domestic hot water.
- Supply mixing valve setting too small
  - Open the valve

Compressor does not start up:

- No need for heat
  - Check the device's status information on the *Info* menu
- The minimum compressor stop time is active
  - Wait 20 minutes and check whether the compressor starts up
- The device has a failure
  - Check the reason for the failure on the *Info* menu and take the necessary measures with the help of the troubleshooting table.

15.3 Troubleshooting table

No.: Failure message	Location	Description	Reason	Action	Action
10: Outdoor temperature sensor	B9	Fault in the outdoor temperature sensor or sensor not connected.	Fault in the electrical system	Contact an authorised technician	Check that the sensor is intact and correctly connected. Contact Gebwell maintenance if necessary.
31: Supply water sensor refrigeration 1	B16	Fault in the refrigeration supply water sensor	Fault in the electrical system	Contact an authorised technician	Check that the sensor is intact and correctly connected. Contact Gebwell maintenance if necessary.
32: Supply water sensor 2	B12	Fault in the supply water sensor in heating circuit 2	Fault in the electrical system	Contact an authorised technician	Check that the sensor is intact and correctly connected. Contact Gebwell maintenance if necessary.
33: Heat pump supply water sensor	B21	Fault in the heat pump's charging supply water sensor	Fault in the electrical system	Contact an authorised technician	Check that the sensor is intact and correctly connected. Contact Gebwell maintenance if necessary.
35: Source input sensor	B91	Fault in the collector input sensor	Fault in the electrical system	Contact an authorised technician	Check that the sensor is intact and correctly connected. Contact Gebwell maintenance if necessary.
36: Hot gas sensor 1	B81	Fault in the hot gas sensor	Fault in the electrical system	Contact an authorised technician	Check that the sensor is intact and correctly connected. Contact Gebwell maintenance if necessary.
44: Heat pump return water sensor	B71	Fault in the heat pump's charging return water sensor	Fault in the electrical system	Contact an authorised technician	Check that the sensor is intact and correctly connected. Contact Gebwell maintenance if necessary.
45: Source output sensor	B92	Fault in the collector output sensor	Fault in the electrical system	Contact an authorised technician	Check that the sensor is intact and correctly connected. Contact Gebwell maintenance if necessary.
50: Domestic hot water sensor 1	B3	Fault in the domestic hot water accumulator sensor	Fault in the electrical system	Contact an authorised technician	Check that the sensor is intact and correctly connected. Contact Gebwell maintenance if necessary.
60: Room temperature sensor 1		Fault in the room temperature sensor	Fault in the electrical system	Contact an authorised technician	Check that the room temperature sensor is connected and is not externally damaged. If necessary, contact an authorised technician
98: Additional module 1		The regulator does not detect expansion module 1 on the bus	Fault in the electrical system	Contact an authorised technician	Check that the ribbon cable between the regulators is attached. Check that current is supplied to the expansion module (green light)
99: Additional module 2		The regulator does not detect expansion module 2 on the bus	Fault in the electrical system	Contact an authorised technician	Check that the ribbon cable between the regulators is attached. Check that current is supplied to the expansion module (green light)
102: No emergency clock operation		The battery in the regulator's user terminal is running out	Fault in the electrical system	Contact an authorised technician	Check that the display's ribbon cable is properly connected to the regulator and the display
105: Service notification		A service notification has been programmed on the regulator		Contact an authorised technician	Perform annual servicing of the equipment
106: Source temp. too low		The collector's input temperature is lower than the value set in the menu. The controller automatically restores the situation after 4 hours.	Flow rate too low in the collector	Check that the stop valves in the collector are open. Check the collector's sanitary trap. If necessary, contact an authorised technician.	Check the functionality of the collector.
107: Hot gas, compr. 1		This alert is triggered when the hot gas sensor shows 130°C. Three alerts are permitted within eight hours for automatic restoration.		Contact an authorised technician	Check the functionality of the refrigeration machinery
No.: Failure message	**Location**	**Description**	**Reason**	**Action**	**Action**

127: Anti-Legionella temperature		The heat pump has not reached the anti-Legionella temperature. The regulator retries charging after the minimum stop time.	Domestic hot water has been consumed while the increase function was active.		
222: Heat pump operation overpressure	E10	The high pressure switch has been triggered	The flow rate in the charging/heat pipe circuit is too low. The radiator or floor heating valves are closed or set too low. Air in the heating network. The pressures in the heating system are too low. Blocked sanitary trap.	Open the radiator/floor heating thermostats. Bleed the heating network. Check the network pressure. Clean the sanitary trap. Check that the charge pump is rotating. If necessary, contact an authorised technician.	Check the functionality of the heat supply network
223: Heating circuit start-up overpressure	E10	The high pressure switch has been triggered when starting up heating	The flow rate in the charging/heat pipe circuit is too low. The radiator or floor heating valves are closed or set too low. Air in the heating network. The pressures in the heating system are too low. Blocked sanitary trap.	Open the radiator/floor heating thermostats. Bleed the heating network. Check the network pressure. Clean the sanitary trap. Check that the charge pump is rotating. If necessary, contact an authorised technician.	Check the functionality of the heat supply network
224: Domestic hot water start-up overpressure	E10	The high pressure switch has been triggered when starting up domestic hot water	Flow rate too low in the charging circuit Air in the heating network. The pressures in the heating system are too low. Blocked sanitary trap.	Bleed the heating network. Check the network pressure. Clean the sanitary trap. Check that the charge pump is rotating. If necessary, contact an authorised technician.	Check the functionality of the change-over valve. Check the functionality of the charging circuit.
225: Underpressure	E9	The low pressure switch has been triggered	Flow rate too low in the collector. Air in the collector. The collector's stop/line regulation valve is closed. The sanitary trap is blocked. Too little fluid in the collector. The water in the heating system is too cold (below 15°C)	Clean the sanitary trap in the collector. If necessary, add fluid to the collector. If necessary, contact an authorised technician.	Check the functionality of the collector. Check the functionality of the soil solution pump.
226: Compr. 1 overload	E11	The protective switch for the compressor has been triggered	The compressor has triggered the protective switch	Put the compressor's protective switch (F1) in the ON position. If necessary, contact an electrician.	Check the heat pump's power supply. Check the functionality of the compressor.
243: Swimming pool sensor	B13		Fault in the electrical system		
324: BX/additional mod. same sensors		Sensors with the same ID have been connected to the BX inputs	Fault in the control system	Contact an authorised technician	Correct the sensor addresses
357: Refrig. circuit 1 supply water temp.		The temperature of the supply water in the cooling circuit is too low	The regulation value is manually operated. Wrong value set.	Check the minimum temperature for the cooling circuit	

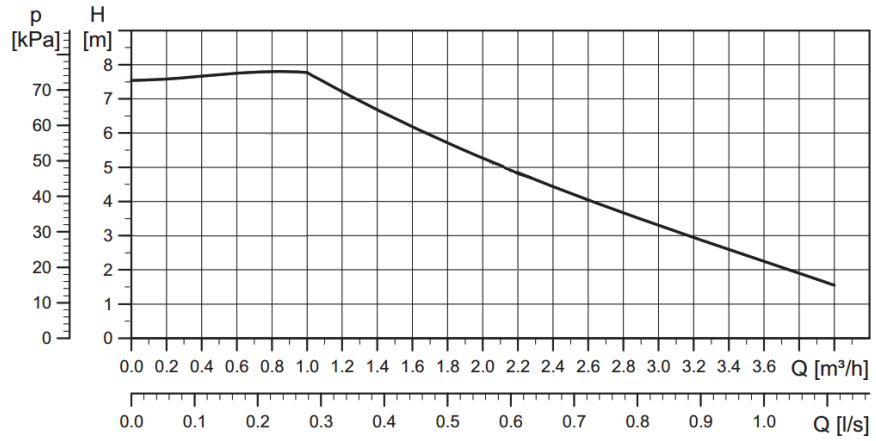
16 TECHNICAL DETAILS

Gebwell Aries		**Aries 6**	**Aries 12**	**Aries 12C**
Power information (according to EN 14511)				
Heating output		1.5–7.5	2.6–12.2	2.6–12.2
0/35 nominal				
Heating output	kW	3.75	6.71	6.71
Supplied power	kW	0.78	1.36	1.36
COP		4.8	4.9	4.9
SCOP (according to EN 14825)		5.6 / 4.2	5.8 / 4.3	5.8 / 4.3
The system's energy efficiency class, average climactic conditions, underfloor heat-		A+++		
Flow-through resistor				
Power	W	4,000	6,000	6,000
Electrical information				
Nominal voltage/electrical connection		400 VAC 3N 50 Hz		
Maximum supply current (incl. the control systems and pumps)	A_{rms}	15.8	19.8	19,8
Built-in electric heater can be connected	kW	2 / 4	2 / 4 / 6	2 / 4 / 6
Recommended fuse size	A	3 x 16	3 x 20	3 x 20
Charge pump power	W	25-60		
Brine pump power	W	35 – 87	40 – 180	40 – 180
Hot water tank				
Volume, domestic hot water/heating	L	185 / 7		no hot water tank
Maximum pressure	bar	10		
Refrigerant circuit				
Includes fluorinated greenhouse gases		yes		
Hermetically sealed		yes		
Refrigerant		R410A		
Global Warming Potential (GWP) of the refrigerant		2,088	2,088	2,088
Quantity of refrigerant	kg	0.92	1.42	1.42
CO_2 equivalence	ton CO_2e	1,920	2,965	2,965
Disconnection, overpressure	MPa	4.4 (44 bar)		
Difference, overpressure	MPa	0.7 (7 bar)		
Disconnection, underpressure	MPa	0.17 (1.7 bar)		
Difference, underpressure	MPa	0.10 (1.0 bar)		
Collector				
Maximum pressure	MPa	0,6 (6 bar)		
Nominal flow rate	l/s	0.19	0.34	0.34
Maximum flow rate	l/s	0.50	1.00	1.00
Maximum external pressure loss at nominal flow rate	kPa	68	110	110
Minimum input temperature of brine	°C	-5		
Maximum input temperature of brine	°C	30		
Heating circuit				
Maximum pressure	MPa	0,6 (6 bar)		
Minimum flow rate	l/s	0.08	0.12	0.12
Nominal flow rate	l/s	0.1	0.18	0.18
Maximum flow rate	l/s	0.35	0.58	0.58
Maximum external pressure loss at nominal flow rate	kPa	61	63	63
Dimensions and weights				
Width x Height x Depth	mm	600 x 1,800 x 660		640 x 970 x 830
Weight	kg	181	190	165
Weight of the compressor unit	kg	99	118	118
Pipe connections				
Brine	mm	28		
Heating	mm	22	28	28
Domestic hot water	mm	22		-
Hot water circulation	mm	15		-
Cold water	mm	22		
Noise level (L_{WA})	dB	34 – 43	36 – 47	36 – 47
Noise pressure level (L_{WP})	dBA	20 – 27	22 – 30	22 – 30
Compressor		Twin rotary (frequency-controlled)		
Controller		Gebwell CLI		

17 Pump diagrams

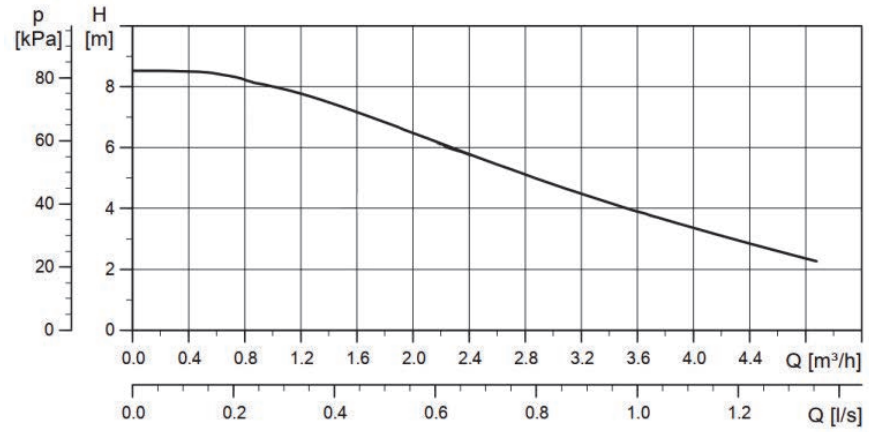
Heating circuit

Aries 6 / 12: UPM3 25-75

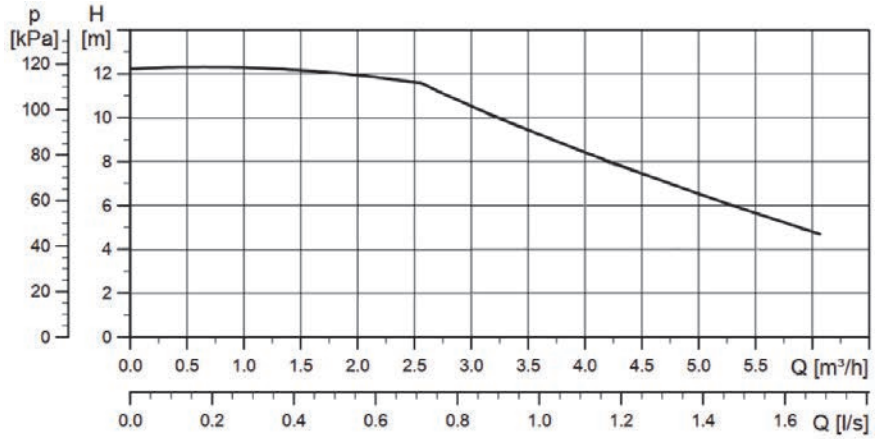


Collector

Aries 6: UPM GEO 25-85



Aries 12: UPMXL GEO 25-125



18 EXAMPLE VALUES FOR HEAT PUMP SETTINGS FOR DIFFERENT HEATING NETWORKS

Heating circuit set points

Row number		*Control row*	*Factory setting*	*Floor heating*	*Radiator heating*	*Air heating*
LP1	**LP2**					
710	*1010*	Comfort operation set point	20			
712	*1012*	Diminished set point	15			
720	*1020*	Heating curve gradient		0.5 (0.3–0.5)	0.8 (0.5–1.0)	0.8 (0.5–1.0)
740	*1040*	Supply water min. set point	15	18	15	15
741	*1041*	Supply water max. set point	45	45 (35–45)	55 (45–60)	55 (45–60)
730	*1030*	Summer/winter heating threshold	16			

19 SERVICE LOG

Date:	Action:	*Fault code:	Technician:

*Fault code: If the device has reported an operating failure, enter the fault code provided by the controller in this column.

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Tuotetiedot / Product Information

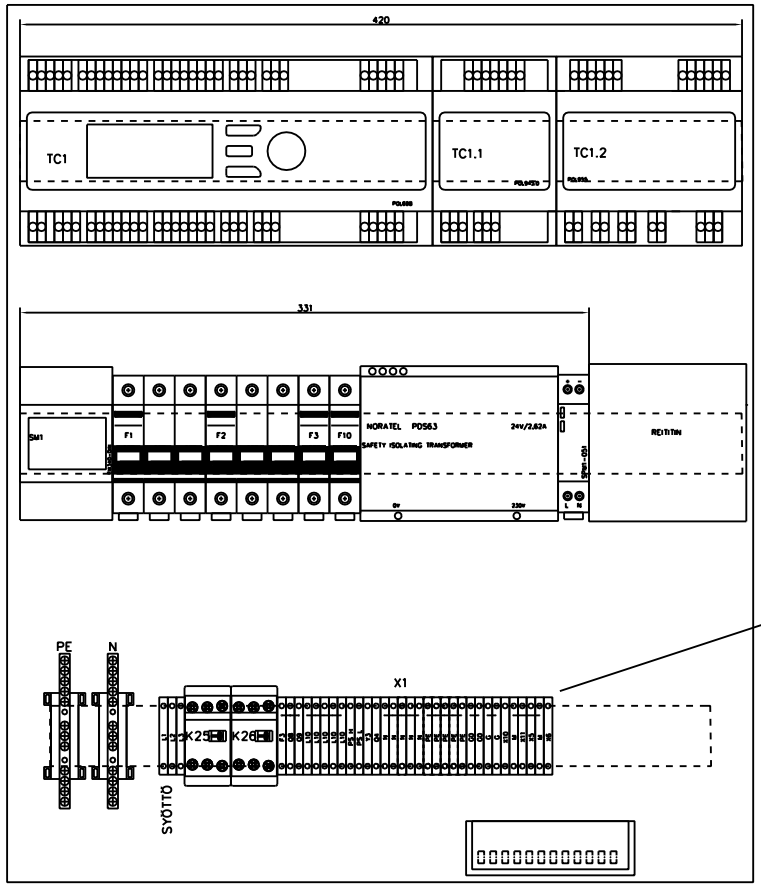
Malli(t):	Model(s):	Aries 6, Aries 12
Ilma-vesi-lämpöpumppu (kyllä/ei):	Air-to-water heat pump (yes/no):	Ei / No
Vesi-vesi-lämpöpumppu (kyllä/ei):	Water-to-water heat pump (yes/no):	Ei / No
Suolavesi-vesi-lämpöpumppu (kyllä/ei):	Brine-to-water heat pump (yes/no):	Kyllä / Yes
Matalan lämpötilan lämpöpumppu (kyllä/ei):	Low-temperature heat pump (yes/no):	Kyllä / Yes (*)
Varustettu lisälämmittimellä (kyllä/ei):	Equipped with a supplementary heater (yes/no):	Kyllä / Yes
Lämpöpumppuyhdistelmälämmitin (kyllä/ei):	Heat pump combination heater (yes/no):	Kyllä / Yes
Parametrit ilmoitettu keskilämpötilan keskimääräisissä ilmasto-olosuhteissa. Mittaukset ja laskelmat suoritettu EN 14825 standardin mukaan.	Parameters are declared for average climate conditions. Measurements and calculations have been carried out according to EN 14825 standard.	

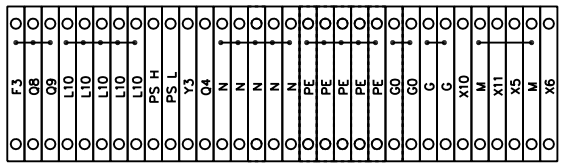
Kohta	Item	Symboli / Symbol	Yksikkö / Unit	Aries 6	Aries 12	Aries 12C
Keskilämpötila sovelluksen tiedot	**Medium temperature application**					
Nimellislämpöteho (**)	**Rated heat output (**)**	***Prated***	**kW**	**6**	**12**	**12**
Ilmoitettu lämmitysteho osakuormalla keskilämpötilan sovelluksesta ulkolämpötilassa T_j.	Declared heating capacity for part load operation in medium-temperature application at outdoor temperature T_j.					
0/52˚C (88 %), T_j = -7˚C	0/52˚C (88 %), T_j = -7˚C	*Pdh*	kW	**5,4**	**10,7**	**10,7**
0/42˚C (54 %), T_j = 2˚C	0/42˚C (54 %), T_j = 2˚C	*Pdh*	kW	**3,8**	**7,1**	**7,1**
0/36 ˚C (35 %), T_j = 7˚C	0/36 ˚C (35 %), T_j = 7˚C	*Pdh*	kW	**2,7**	**4,0**	**4,0**
0/30 ˚C (15 %), T_j = 12˚C	0/30 ˚C (15 %), T_j = 12˚C	*Pdh*	kW	**2,3**	**2,7**	**2,7**
T_j = kaksiarvoinen lämpötila	T_j = bivalent temperature	*Pdh*	kW	**5,8**	**11,7**	**11,7**
Kaksiarvoinen lämpötila	Bivalent temperature	T_{biv}	˚C	**-10**	**-10**	**-10**
Alenemiskerroin (***)	Degradation co-efficient (***)	*Cdh*	-	**0,9**	**0,9**	**0,9**
Tilalämmityksen kausittainen energiatehokkuusluokka	Seasonal space heating energy efficiency class		-	**A+++**	**A+++**	**A+++**
Tilalämmityksen kausittainen energiatehokkuus	Seasonal space heating energy efficiency	η_s	%	**167**	**171**	**171**
Ilmoitettu lämpökerroin osakuormalla keskilämpötilan sovelluksesta ulkolämpötilassa T_j.	Declared coefficient of performance for part load operation in medium-temperature application at outdoor temperature T_j.					
0/52˚C (88 %), T_j = -7˚C	0/52˚C (88 %), T_j = -7˚C	*COPd*	-	**2,61**	**2,95**	**2,95**
0/42˚C (54 %), T_j = 2˚C	0/42˚C (54 %), T_j = 2˚C	*COPd*	-	**3,66**	**4,13**	**4,13**
0/36 ˚C (35 %), T_j = 7˚C	0/36 ˚C (35 %), T_j = 7˚C	*COPd*	-	**4,56**	**5,13**	**5,13**
0/30 ˚C (15 %), T_j = 12˚C	0/30 ˚C (15 %), T_j = 12˚C	*COPd*	-	**5,35**	**4,82**	**4,82**
T_j = kaksiarvoinen lämpötila	T_j = bivalent temperature	*COPd*	-	**2,30**	**2,89**	**2,89**
Matalan lämpötilasovelluksen tiedot	**Low temperature application**					
Nimellislämpöteho (**)	Rated heat output (**)	*Prated*	kW	**7**	**13**	**13**
Ilmoitettu lämmitysteho osakuormalla matalanlämpötilan sovelluksesta ulkolämpötilassa T_j.	Declared coefficient of performance for part load operation in low-temperature application at outdoor temperature T_j.					
0/34˚C (88 %), T_j = -7˚C	0/34˚C (88 %), T_j = -7˚C	*Pdh*	kW	**6,4**	**11,6**	**11,6**
0/30˚C (54 %), T_j = 2˚C	0/30˚C (54 %), T_j = 2˚C	*Pdh*	kW	**4,5**	**8,2**	**8,2**
0/27 ˚C (35 %), T_j = 7˚C	0/27 ˚C (35 %), T_j = 7˚C	*Pdh*	kW	**3,0**	**5,8**	**5,8**
0/24 ˚C (15 %), T_j = 12˚C	0/24 ˚C (15 %), T_j = 12˚C	*Pdh*	kW	**2,4**	**3,4**	**3,4**
T_j = kaksiarvoinen lämpötila	T_j = bivalent temperature	*Pdh*	kW	**6,9**	**12,5**	**12,5**
Kaksiarvoinen lämpötila	Bivalent temperature	T_{biv}	˚C	**-10**	**-10**	**-10**
Alenemiskerroin (***)	Degradation co-efficient (***)	*Cdh*	-	**0,9**	**0,9**	**0,9**
Tilalämmityksen kausittainen energiatehokkuusluokka	Seasonal space heating energy efficiency class		-	**A+++**	**A+++**	**A+++**
Tilalämmityksen kausittainen energiatehokkuus	Seasonal space heating energy efficiency	η_s	%	**202**	**227**	**227**
Ilmoitettu lämpökerroin osakuormalla matalanlämpötilan sovelluksesta ulkolämpötilassa T_j.	Declared coefficient of performance for part load operation.					
0/34˚C (88 %), T_j = -7˚C	0/34˚C (88 %), T_j = -7˚C	*COPd*	-	**3,86**	**4,39**	**4,39**
0/30˚C (54 %), T_j = 2˚C	0/30˚C (54 %), T_j = 2˚C	*COPd*	-	**4,54**	**5,33**	**5,33**
0/27 ˚C (35 %), T_j = 7˚C	0/27 ˚C (35 %), T_j = 7˚C	*COPd*	-	**5,32**	**6,17**	**6,17**
0/24 ˚C (15 %), T_j = 12˚C	0/24 ˚C (15 %), T_j = 12˚C	*COPd*	-	**5,87**	**5,81**	**5,81**
T_j = kaksiarvoinen lämpötila	T_j = bivalent temperature	*COPd*	-	**3,75**	**4,36**	**4,36**
Tehonkulutus muissa tiloissa kuin aktiivisessa toimintatilassa	**Power consumption in modes other than active mode**					
Pois päältä -tila	Off mode	P_{OFF}	kW	**0,043**	**0,043**	**0,043**
Termostaatti pois päältä -tila	Thermostat-off mode	P_{TO}	kW	**0,043**	**0,043**	**0,043**
Valmiustila	Standby mode	P_{SB}	kW	**0,043**	**0,043**	**0,043**
Kampikammion lämmitys -tila	Crankcase heater mode	P_{CK}	kW	**0,000**	**0,000**	**0,000**
Muut kohdat	**Other items**					
Tehon säätö *kiinteä / muuttuva*	Capacity control *fixed / variable*			**muuttuva / variable**	**muuttuva / variable**	**muuttuva / variable**
Äänitehotaso, sisällä	Sound power level, indoors	L_{WA}	dB	**34-43**	**36-47**	**36-47**
Suolaveden nimellisvirtaus	Rated brine or water flow rate	-	m^3/h	**0,90**	**1,51**	**1,51**
Vedenlämmitin	**Water heater**					
Ilmoitettu kuormitusprofiili	Declared load profile			**XL**	**XL**	-
Vuorokautinen sähkönkulutus	Daily electricity consumption	Q_{elec}	kWh	**6,252**	**6,211**	-
Vedenlämmityksen energiatehokkuus	Water heating energy efficiency	η_{wh}	%	**122**	**123**	-
Lisälämmitin	**Supplementary heater**					
Nimellislämpöteho (**)	Rated heat output (**)	*Psup*	kW	**6,0**	**6,0**	**6,0**
Ottoenergian tyyppi	Type of energy input			**Sähkö /Electricity**	**Sähkö /Electricity**	**Sähkö /Electricity**

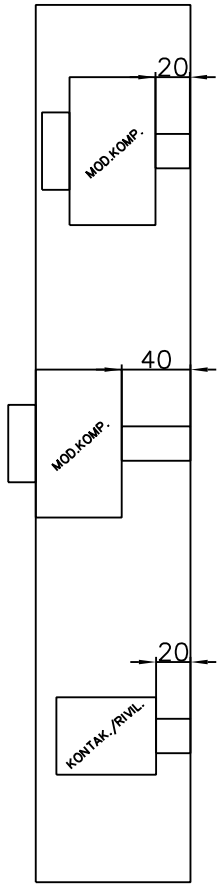
Yhteystiedot	Contact details	Gebwell Oy, Patruunapolku 5, 79100 Leppävirta, Finland

(*) Aries lämpöpumppu soveltuu keskilämpötilan ja matalanlämpötilan sovelluksiin.
(**) Lämpöpumpputilalämmittimillä ja lämpöpumppuyhdistelmälämmittimillä nimellislämpöteho Prated on yhtä suuri kuin lämmityksen mitoituskuorma Pdesignh ja lisälämmittimen nimellislämpöteho Psup on yhtä suuri kuin lisälämmitysteho sup(Tj).
(***) Jos Cdh:n arvoa ei määritetä mittaamalla, alenemiskertoimen oletusarvo on Cdh = 0,9.

(*) Aries heat pump is suitable for medium temperature as well as low temperature applications.
(**) For heat pump space heaters and heat pump combination heaters, the rated heat output Prated is equal to the design load for heating Pdesignh, and the rated heat output of a supplementary heater Psup is equal to the supplementary capacity for heating sup(Tj).
(***) If Cdh is not determined by measurement then the default degradation coefficient is Cdh = 0,9.







TECHNICAL DETAILS		
VOLTAGE	Un	400 V
CURRENT	In	3X16 A
CONTROL VOLTAGE	U	5-24V AC DC
CONTROL VOLTAGE	U	230V AC
IP-CATEGORY	IP	20
MAX TEMPERATURE		35°C

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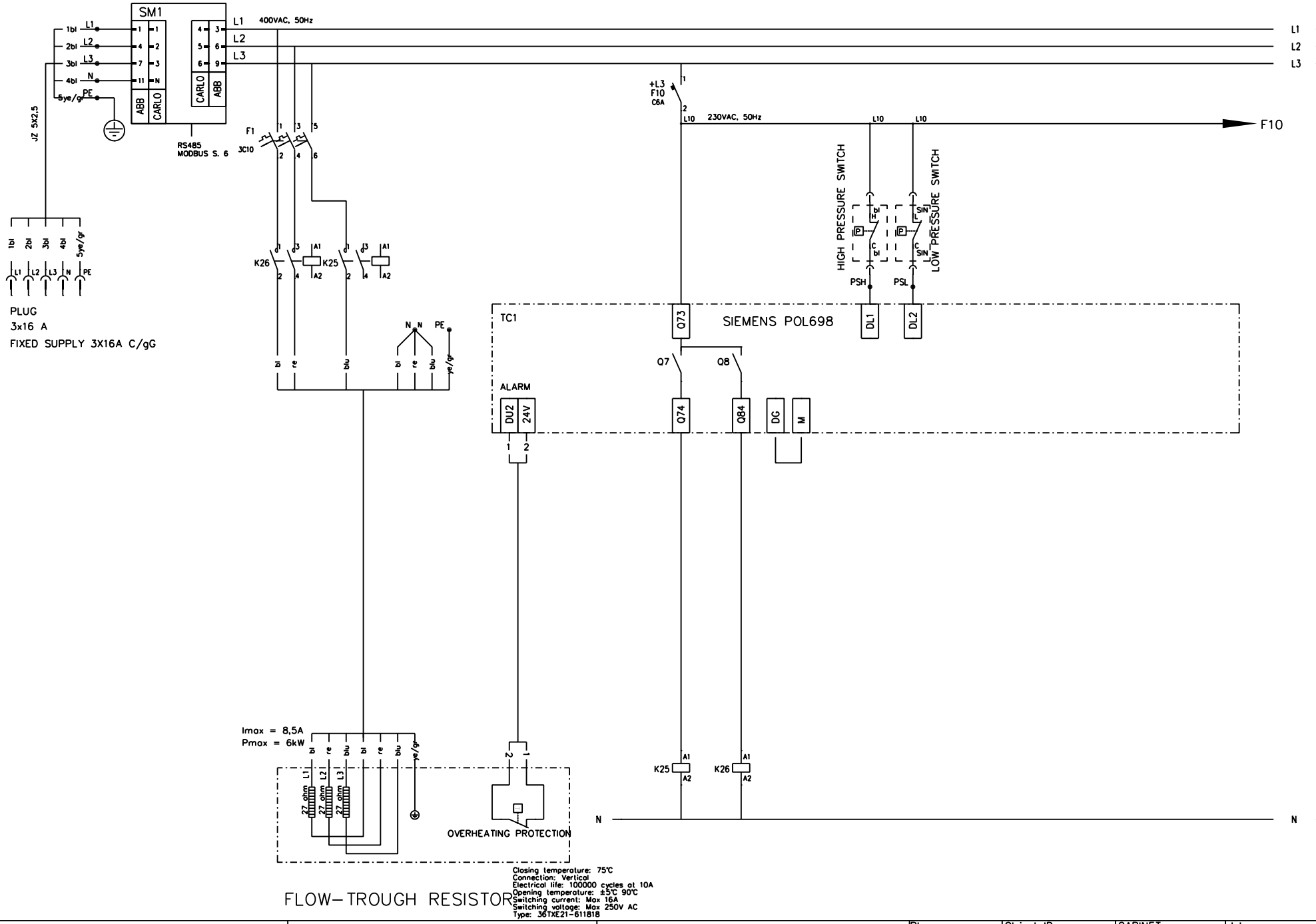
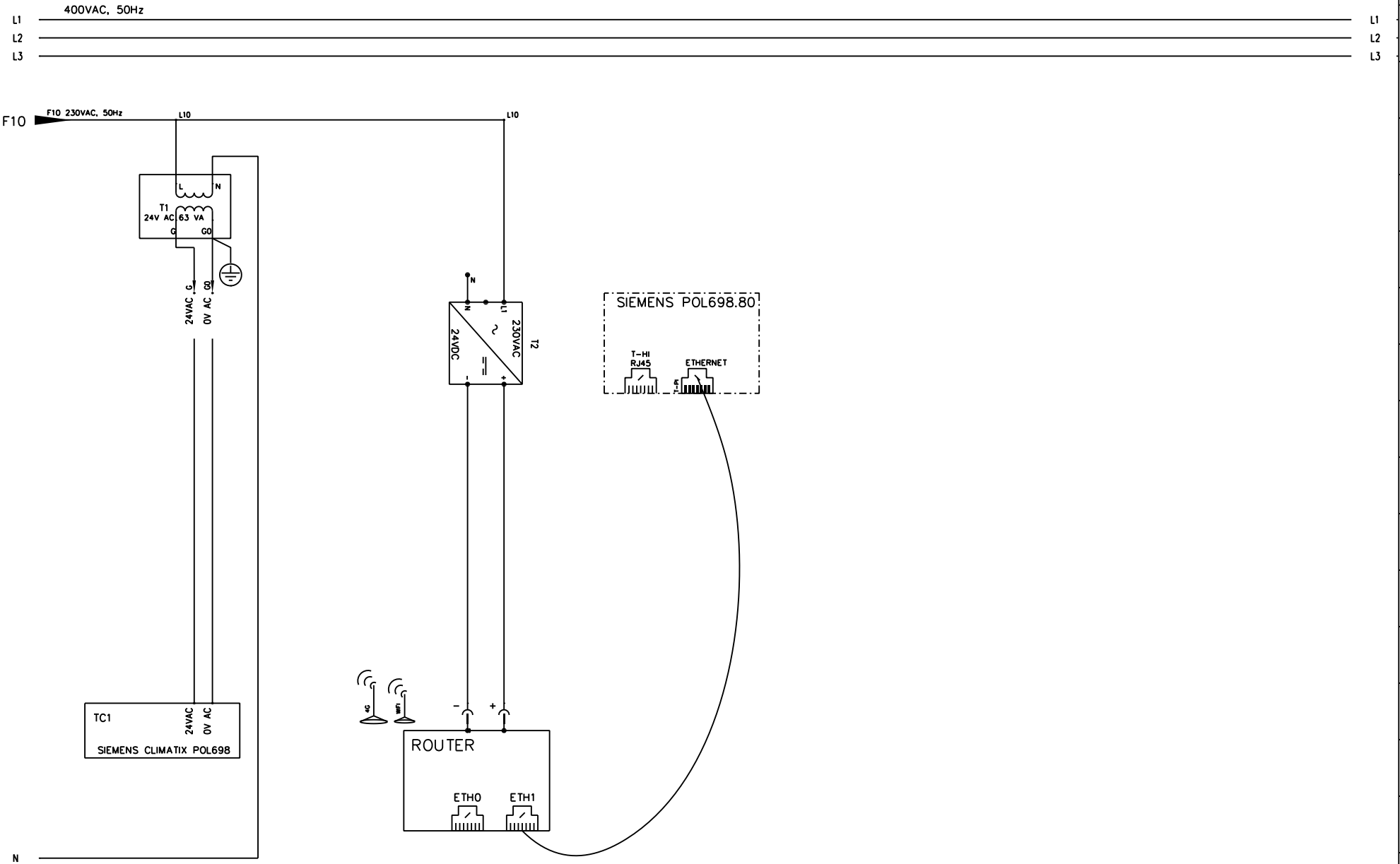
ARIES 6
CONTROL CABINET
LAYOUT

Plan. EH /18.11.2024	Object ID =ARIES	CABINET	Job no. ARIES_OHJ
Draw. EH	Sheet 1/12	Drawing no. EL EL116	
Check			

D rev E rev F rev A rev B Rev. C Rev.



GEBWELL	ARIES 6 CONTROL CABINET CIRCUIT DIAGRAM	Plan. EH /18.11.2024 Draw. EH Check	Object ID =ARIES Sheet 2/12	CABINET Drawing no. EL EL116	Job no. ARIES_OHJ



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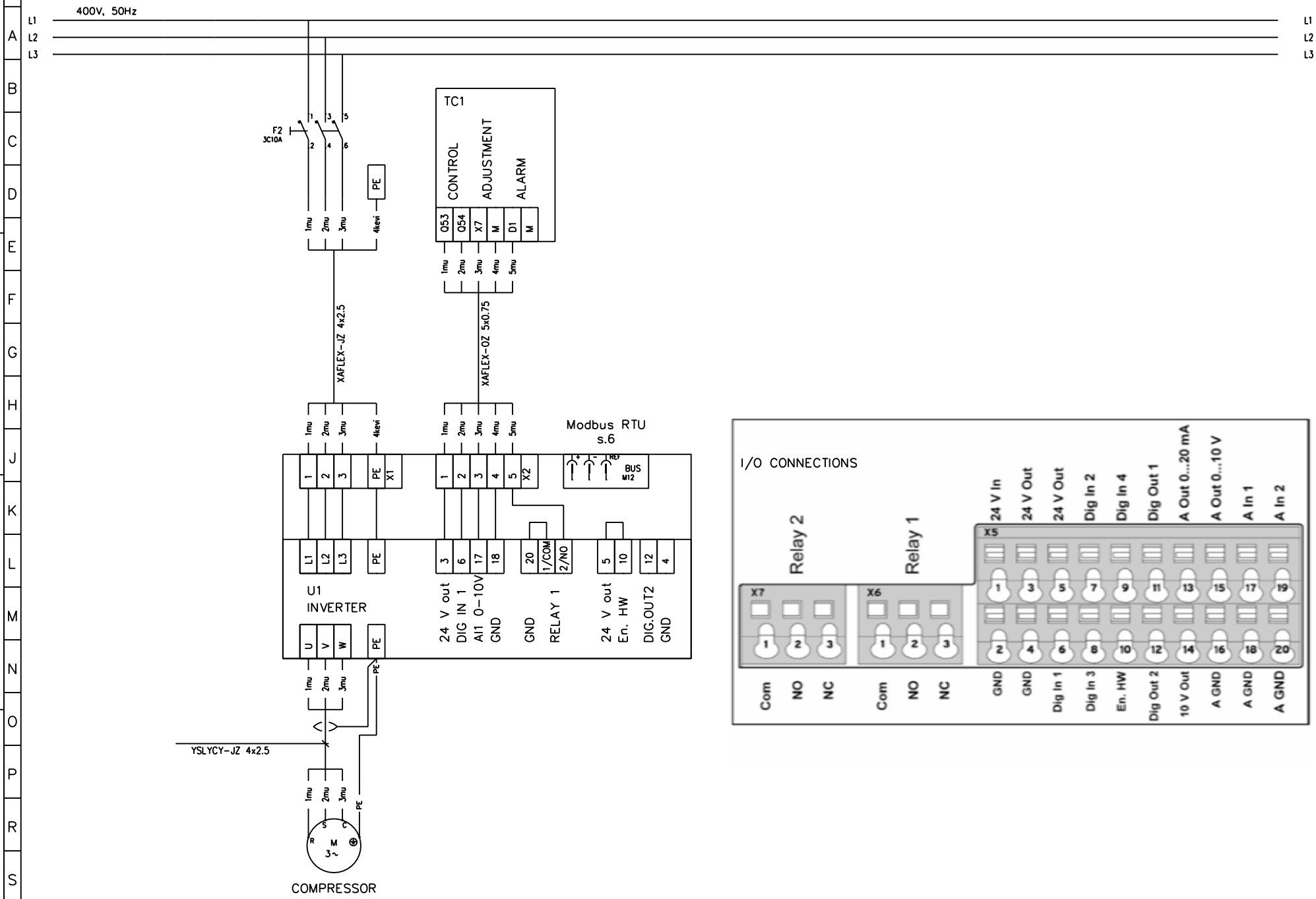
ARIES 6
CONTROL CABINET
CIRCUIT DIAGRAM

Plan. KT /18.11.2024	Object ID =ARIES	CABINET	Job no. ARIES_OHJ
Draw. KT	Sheet 3/12	Drawing no. EL EL116	
Check			

A rev | B Rev. | C Rev. | D rev | E rev | F rev



D rev
E rev
F rev
A rev
B Rev.
C Rev.

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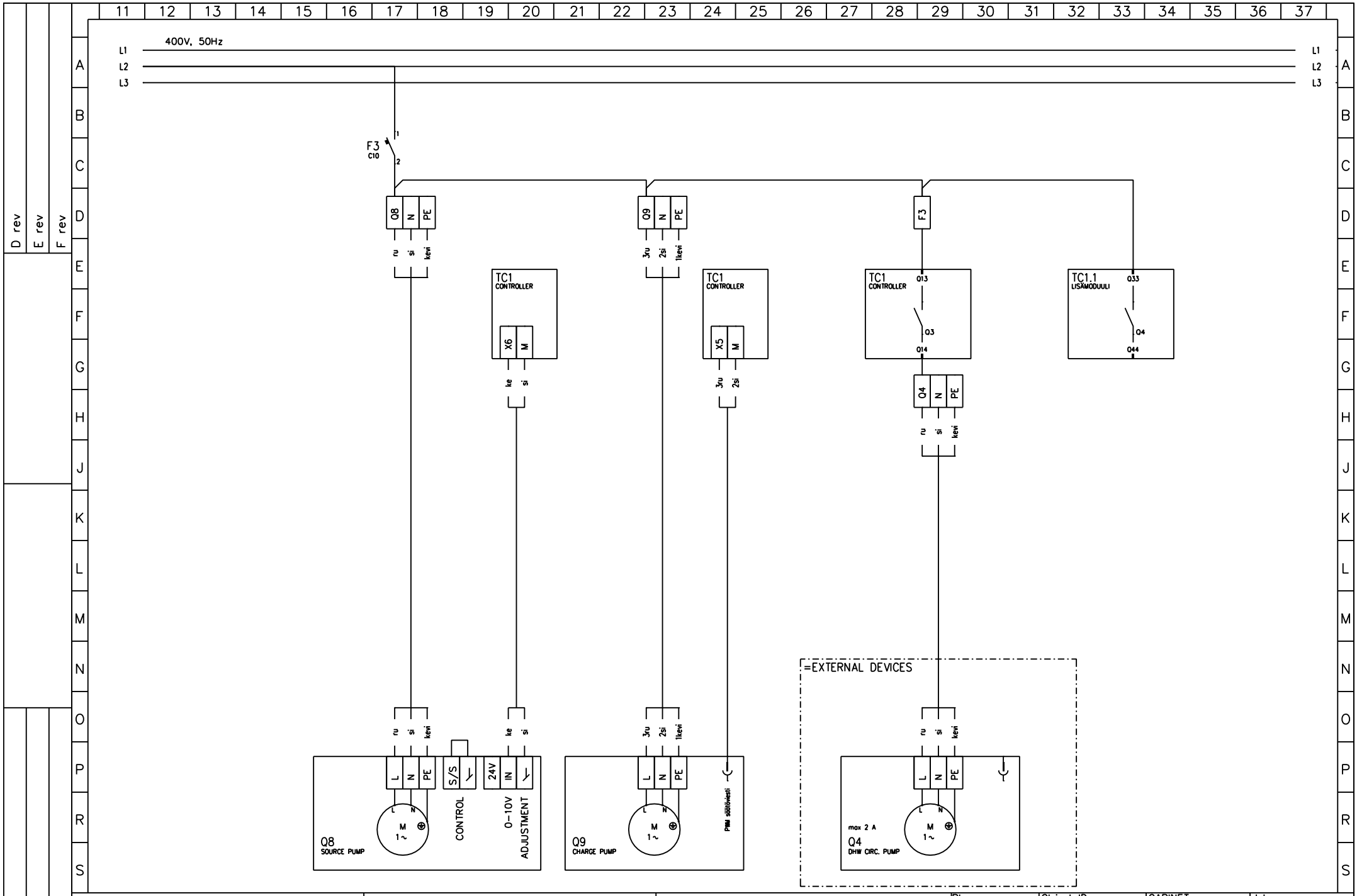
ARIES 6
CONTROL CABINET
CIRCUIT DIAGRAM

Plan. EH /18.11.2024	Object ID =ARIES	CABINET	Job no. ARIES_OHJ
Draw. EH	Sheet 4 / 12	Drawing no. EL EL116	
Check			



D rev
E rev
F rev
A rev
B Rev.
C Rev.

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ARIES 6
CONTROL CABINET
CIRCUIT DIAGRAM

Plan. EH /18.11.2024	Object ID =ARIES	CABINET	Job no. ARIES_OHJ
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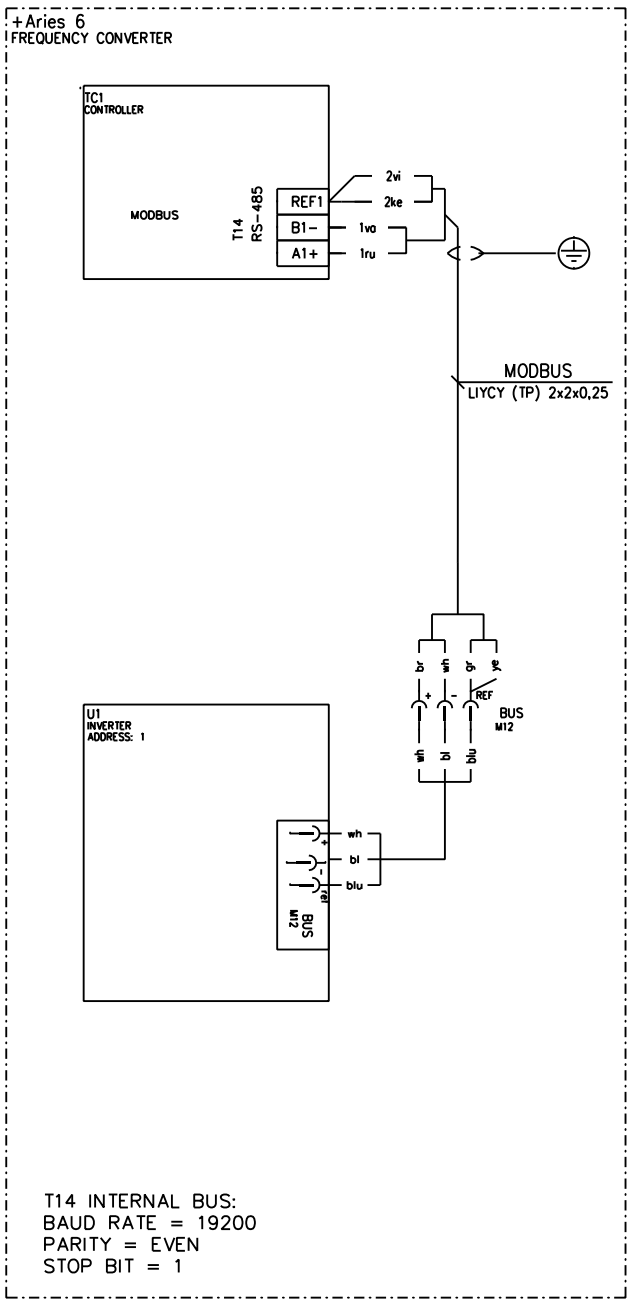
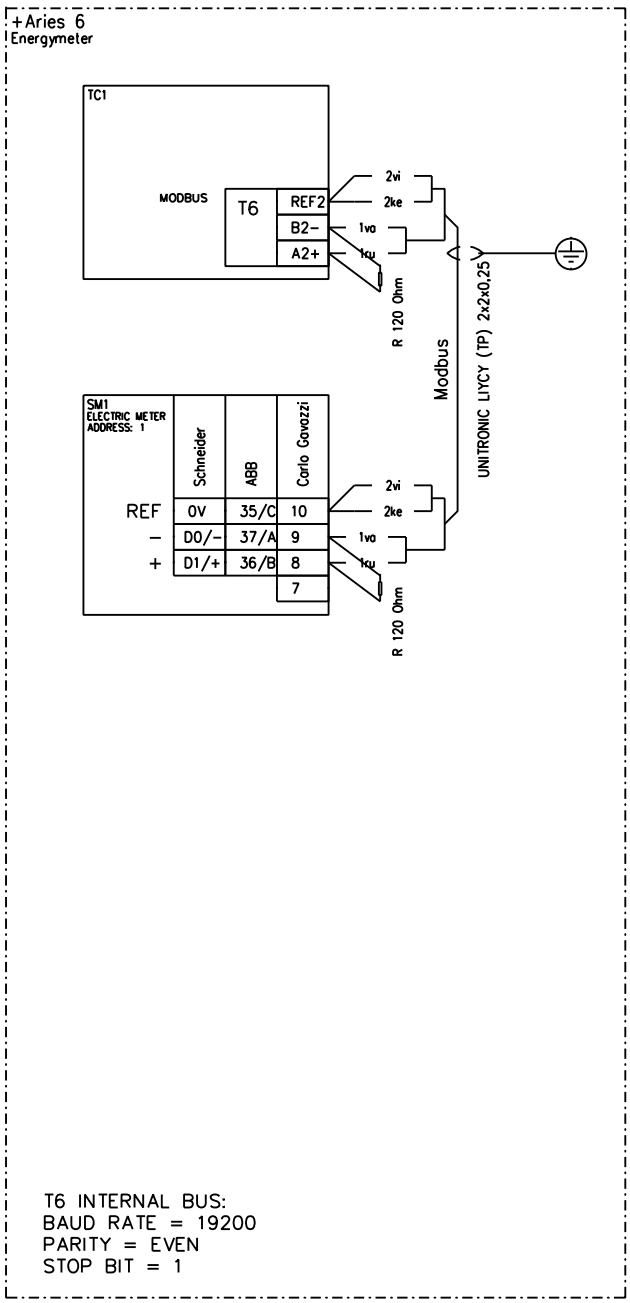
Check			





D rev
E rev
F rev
A rev
B Rev.
C Rev.

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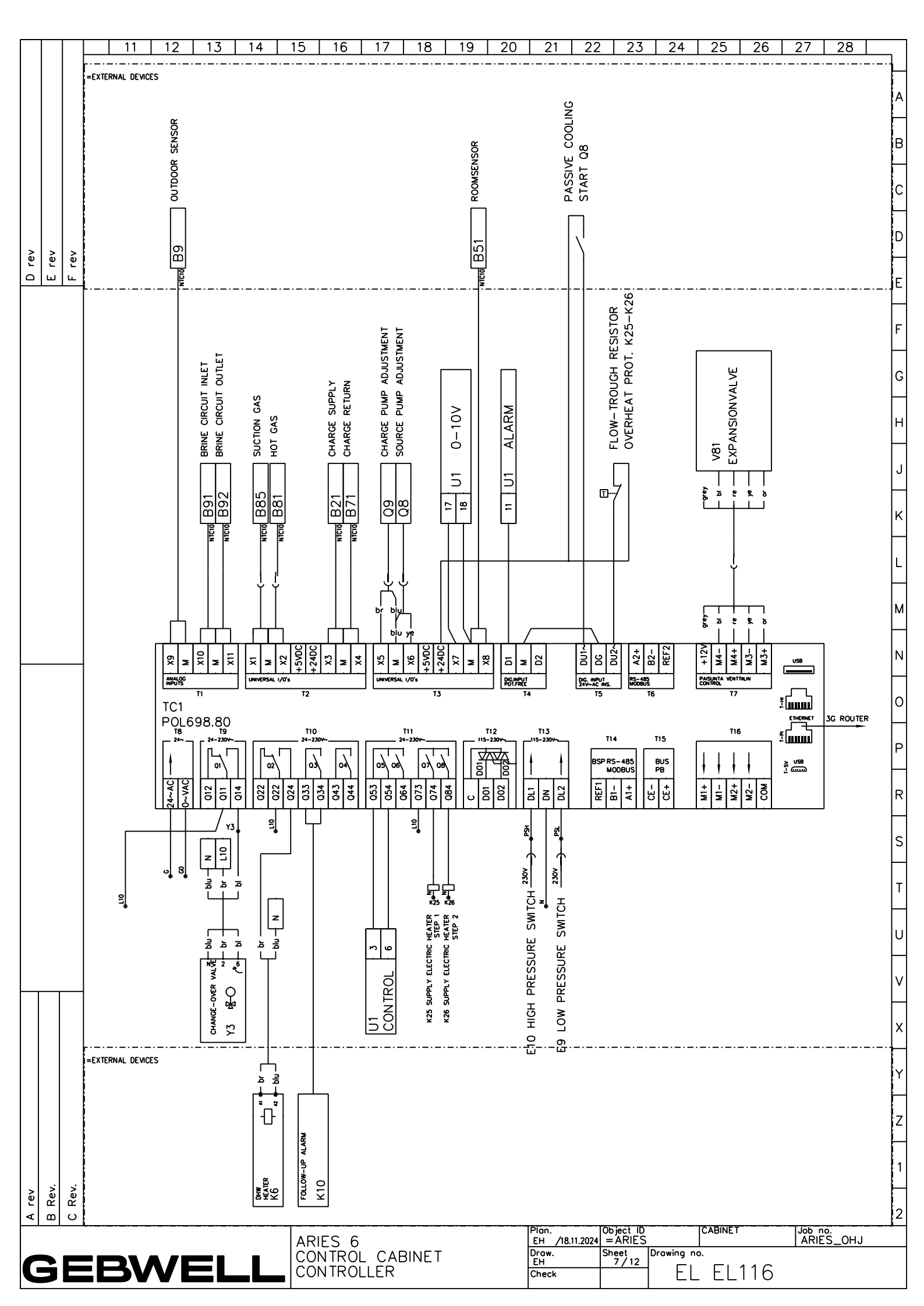
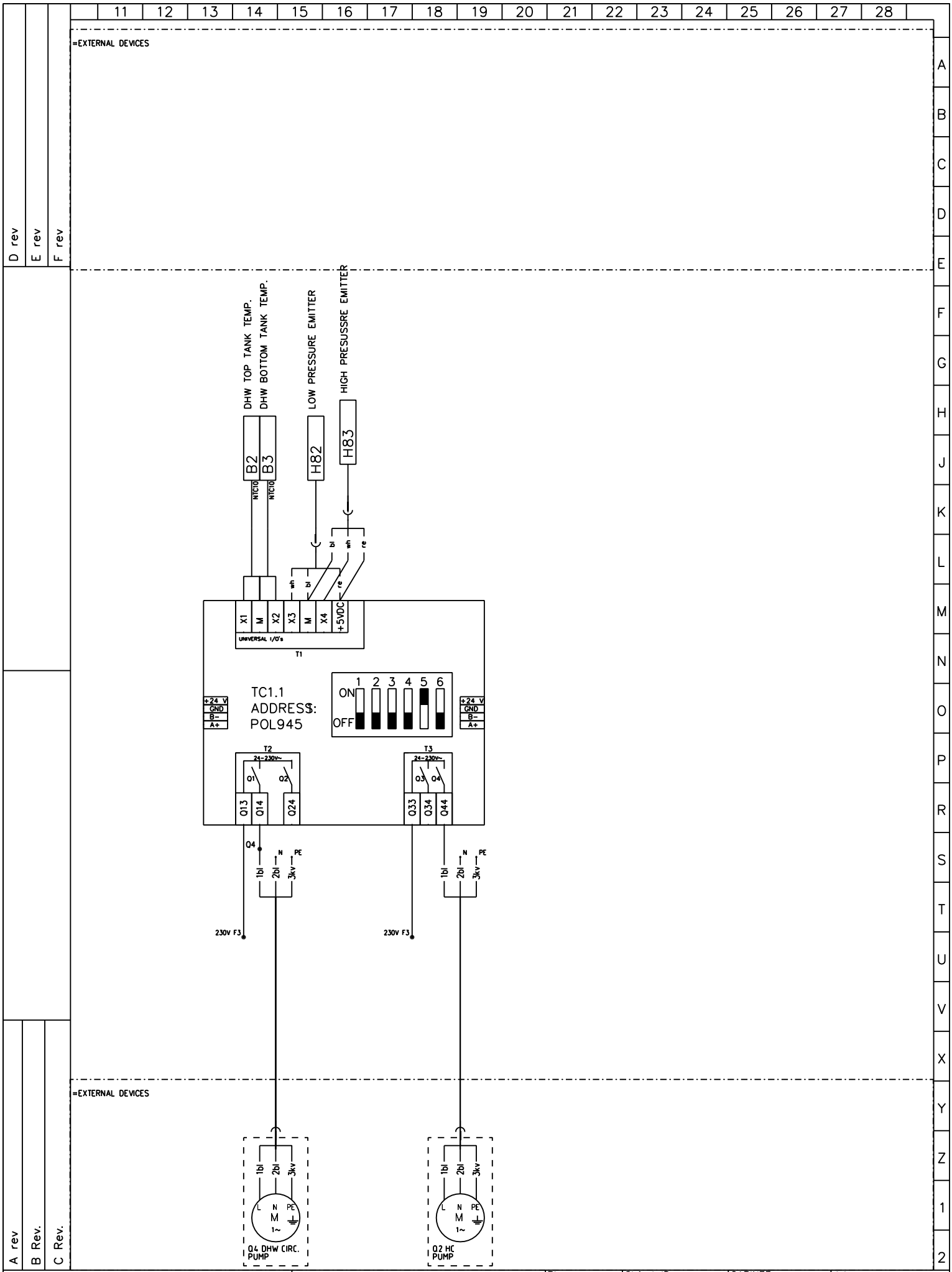
ARIES 6
MODBUS
INTERNAL BUS

Plan. KT /18.11.2024	Object ID =ARIES	CABINET	Job no. ARIES_OHJ
Draw. KT	Sheet 6/12	Drawing no. EL EL116	
Check			

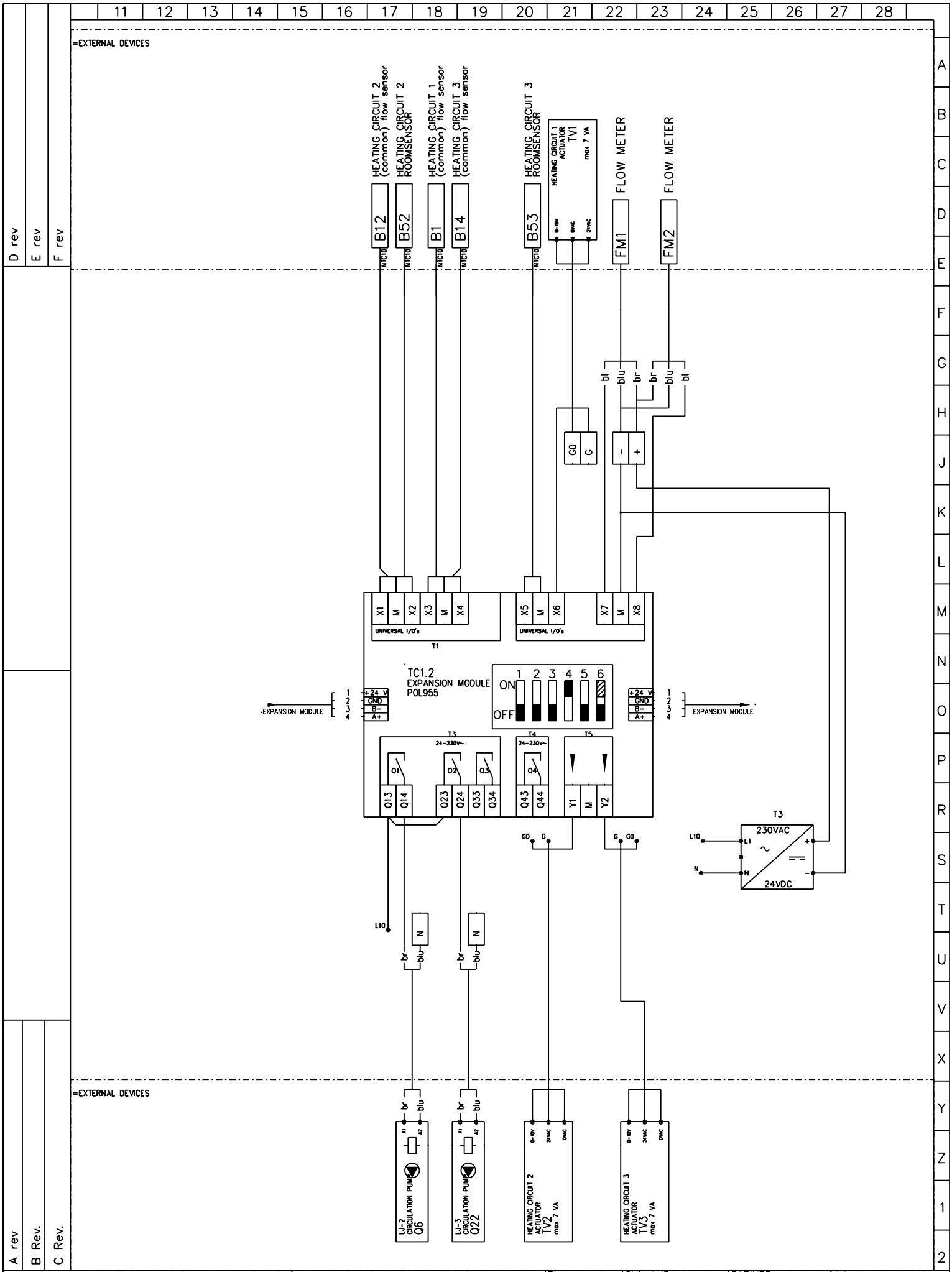


GEBWELL	ARIES 6 CONTROL CABINET CONTROLLER	Plan. EH /18.11.2024	Object ID =ARIES	CABINET
		Draw. EH	Sheet 7/12	Drawing no. EL EL116
		Check		Job no. ARIES_OHJ



GEBWELL	ARIES 6 CONTROL CABINET EXPANSION MODULE	Plan. EH /18.11.2024	Object ID =ARIES	CABINET
		Draw. EH	Sheet 8/12	Drawing no. EL EL116
		Check		

Job no. ARIES_OHJ

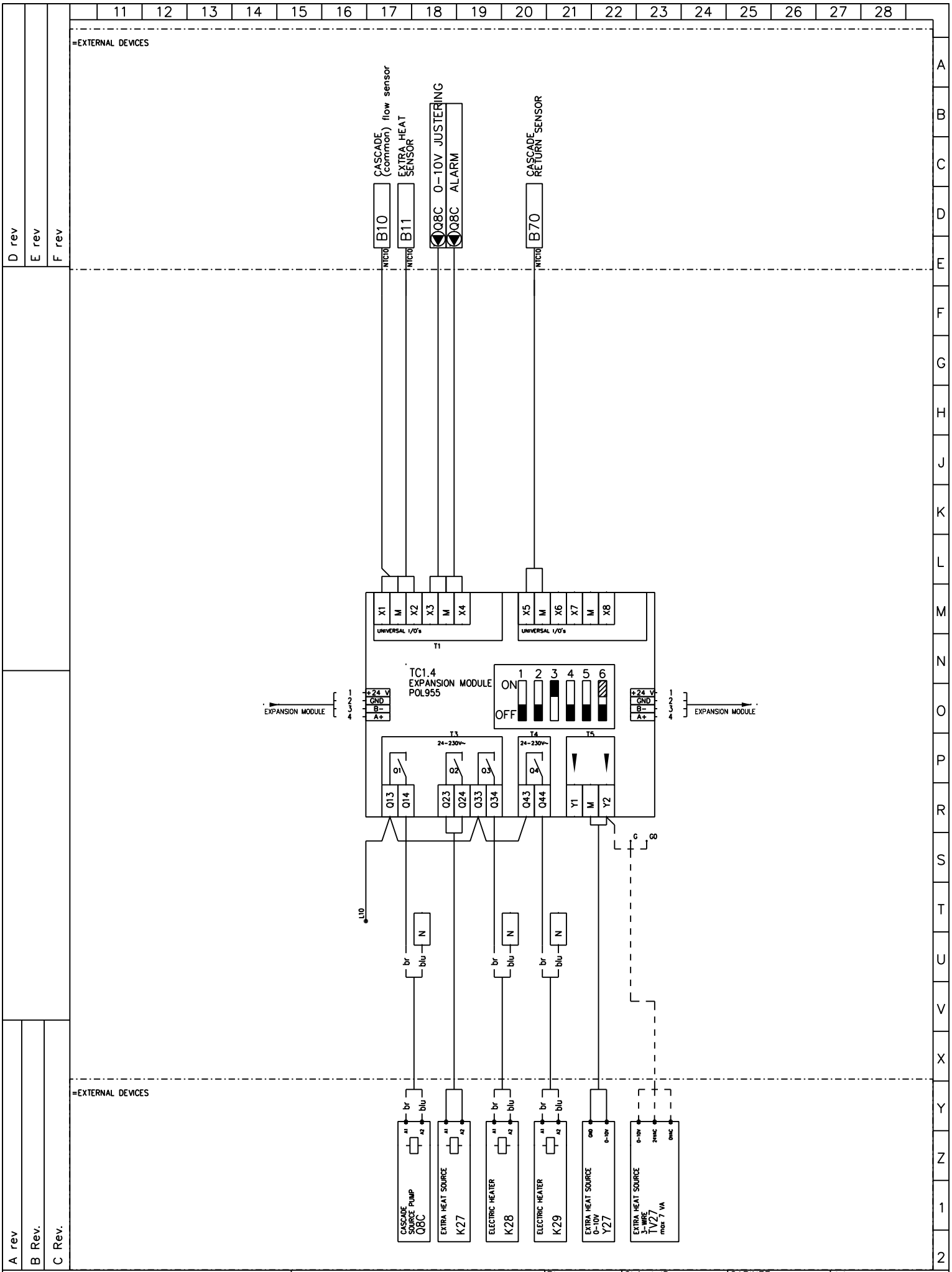


D rev
E rev
F rev
A rev
B Rev.
C Rev.

GEBWELL

ARIES 6
ACCESSORY
HC CONTROL

Plan.	Object ID	CABINET	Job no.
EH /18.11.2024	=ARIES		ARIES_OHJ
Draw. EH	Sheet 9/12	Drawing no. EL EL116	
Check			



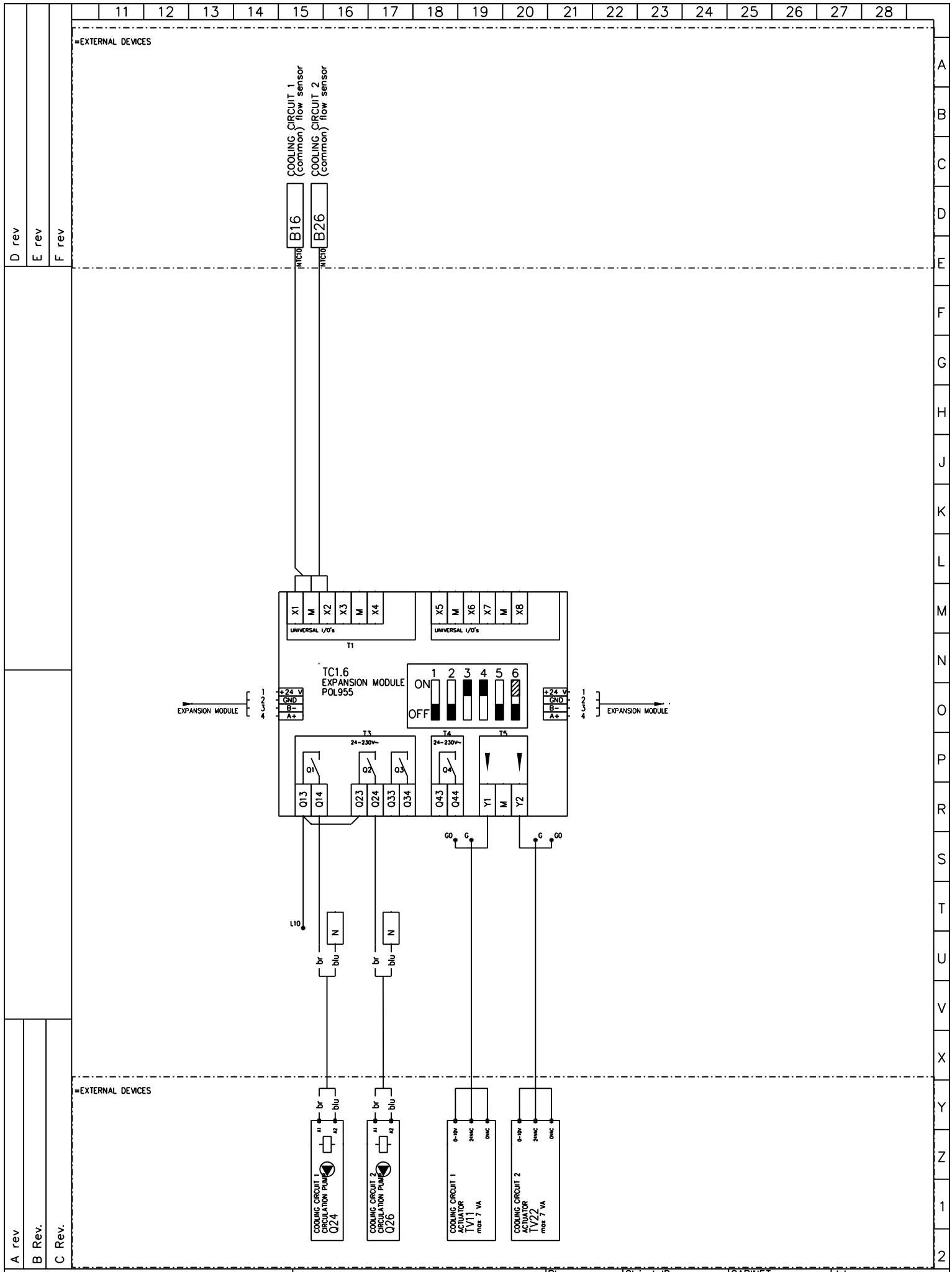
D rev
E rev
F rev

A rev
B Rev.
C Rev.

GEBWELL

ARIES 6
ACCESSORY
CASCADE & EXTRA HEAT

Plan. EH /18.11.2024	Object ID =ARIES	CABINET	Job no. ARIES_OHJ
Draw. EH	Sheet 10/12	Drawing no. EL EL116	
Check			

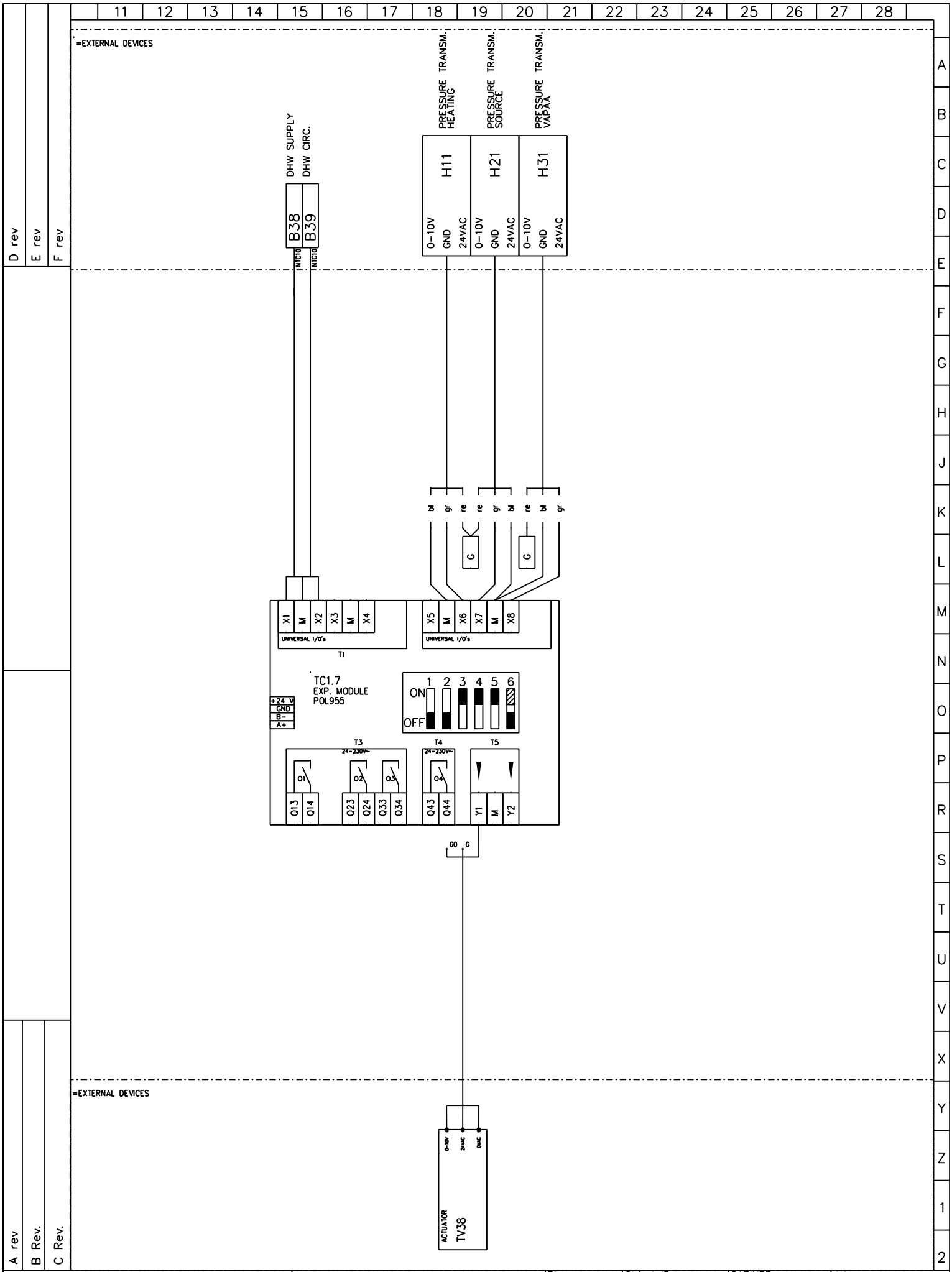


D rev
E rev
F rev
A rev
B Rev.
C Rev.

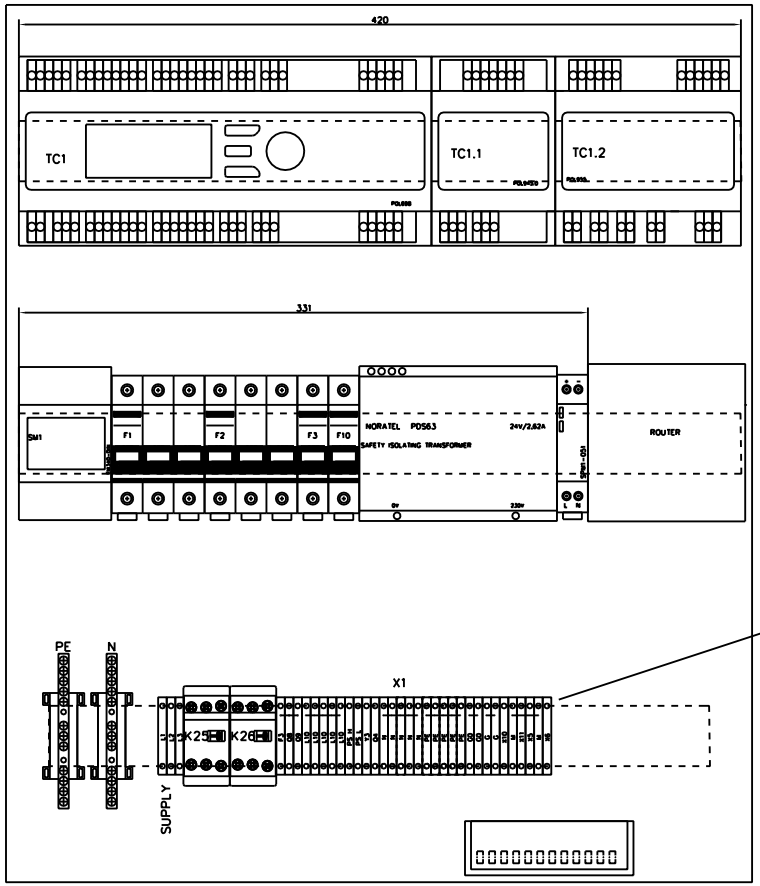
GEBWELL

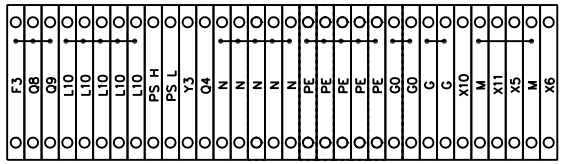
ARIES 6
ACCESSORY
COOLING CIRC. CONTROL

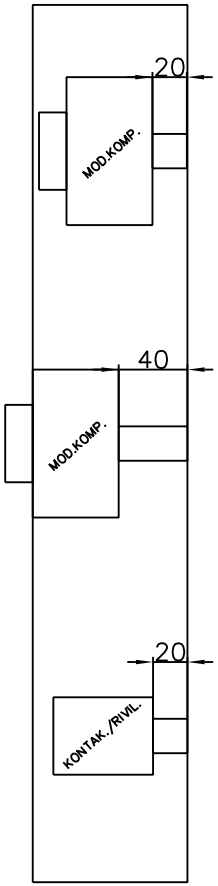
Plan. EH /18.11.2024	Object ID =ARIES	CABINET	Job no. ARIES_OHJ
Draw. EH	Sheet 11/12	Drawing no. EL EL116	
Check			



GEBWELL	ARIES 6 ACCESSORY DHW CONTROL	Plan. EH /18.11.2024	Object ID =ARIES	CABINET	Job no. ARIES_OHJ
		Draw. EH	Sheet 12/12	Drawing no. EL EL116	
		Check			







TECHNICAL DETAILS		
VOLTAGE	Un	400 V
CURRENT	In	3X20 A
CONTROL VOLTAGE	U	5–24V AC DC
CONTROL VOLTAGE	U	230V AC
IP–CATEGORY	IP	20
MAX TEMPERATURE		35°C

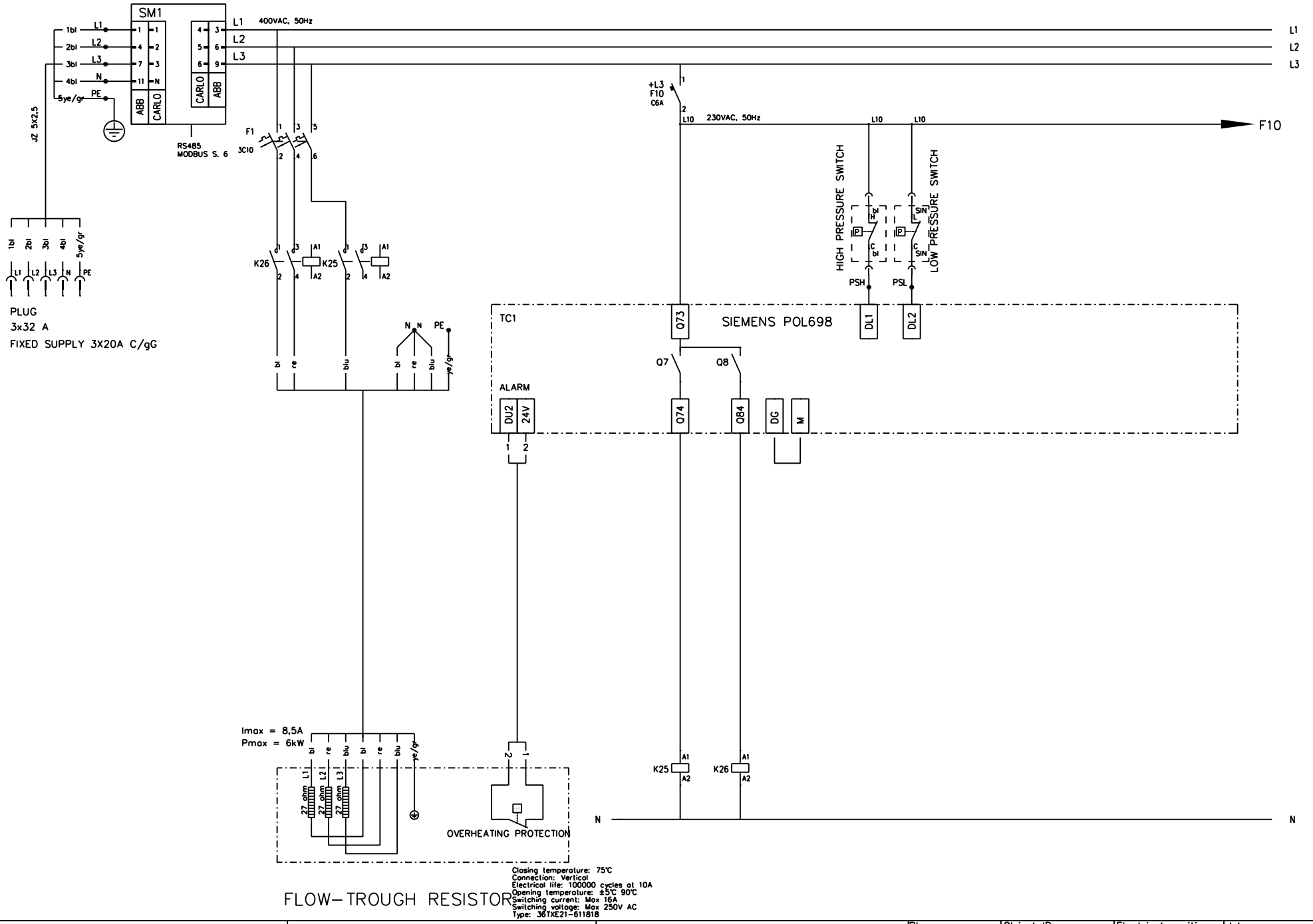
D rev | E rev | F rev

A rev | B Rev. | C Rev.

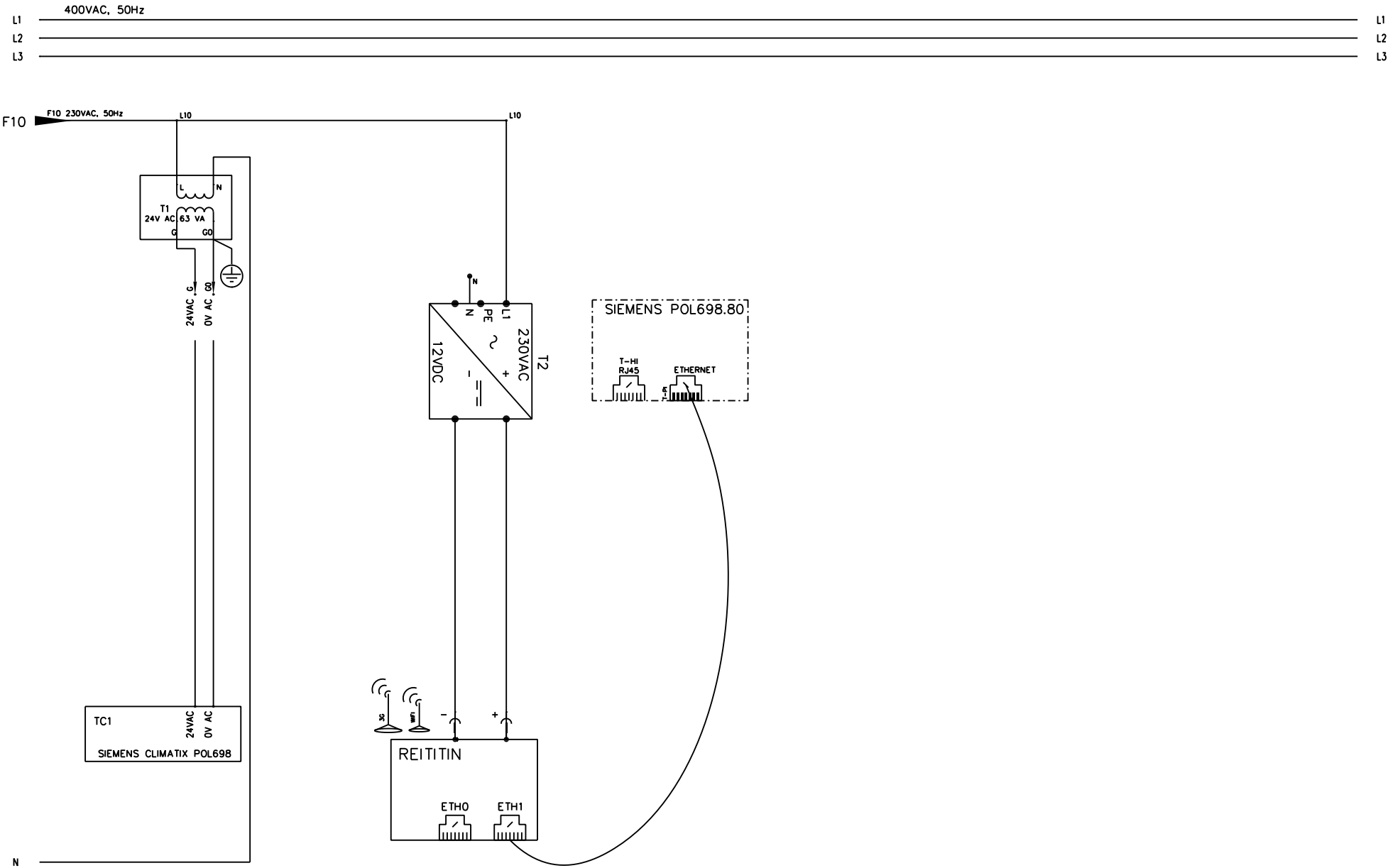
GEBWELL

ARIES 12
CONTROL CABINET
LAYOUT

Plan.	Object ID	Electrical position	Job no.
EH /20.11.2024	=ARIES		
Draw. EH	Sheet 1/12	Drawing no. EL EL109	
Check			



GEBWELL	ARIES 12 CONTROL CABINET CIRCUIT DIAGRAM	Plan. EH /20.11.2024	Object ID =ARIES	Electrical position	Job no.
		Draw. EH	Sheet 2/12	Drawing no. EL EL109	
		Check			

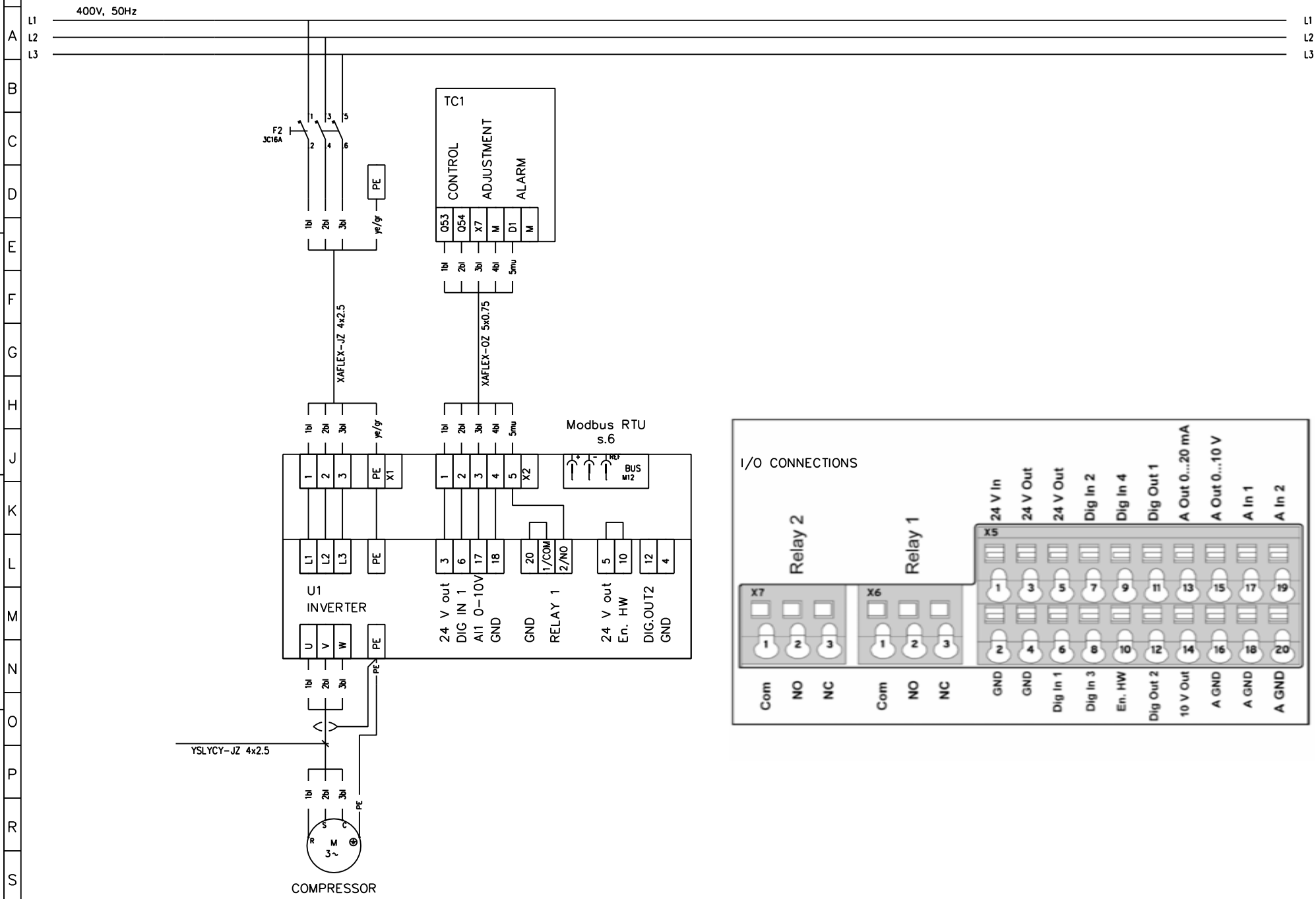


GEBWELL

ARIES 12
CONTROL CABINET
CIRCUIT DIAGRAM

Plan. EH /20.11.2024	Object ID =ARIES	Electrical position	Job no.
Draw. EH	Sheet 3/12	Drawing no. EL EL109	
Check			

D rev
E rev
F rev
A rev
B Rev.
C Rev.

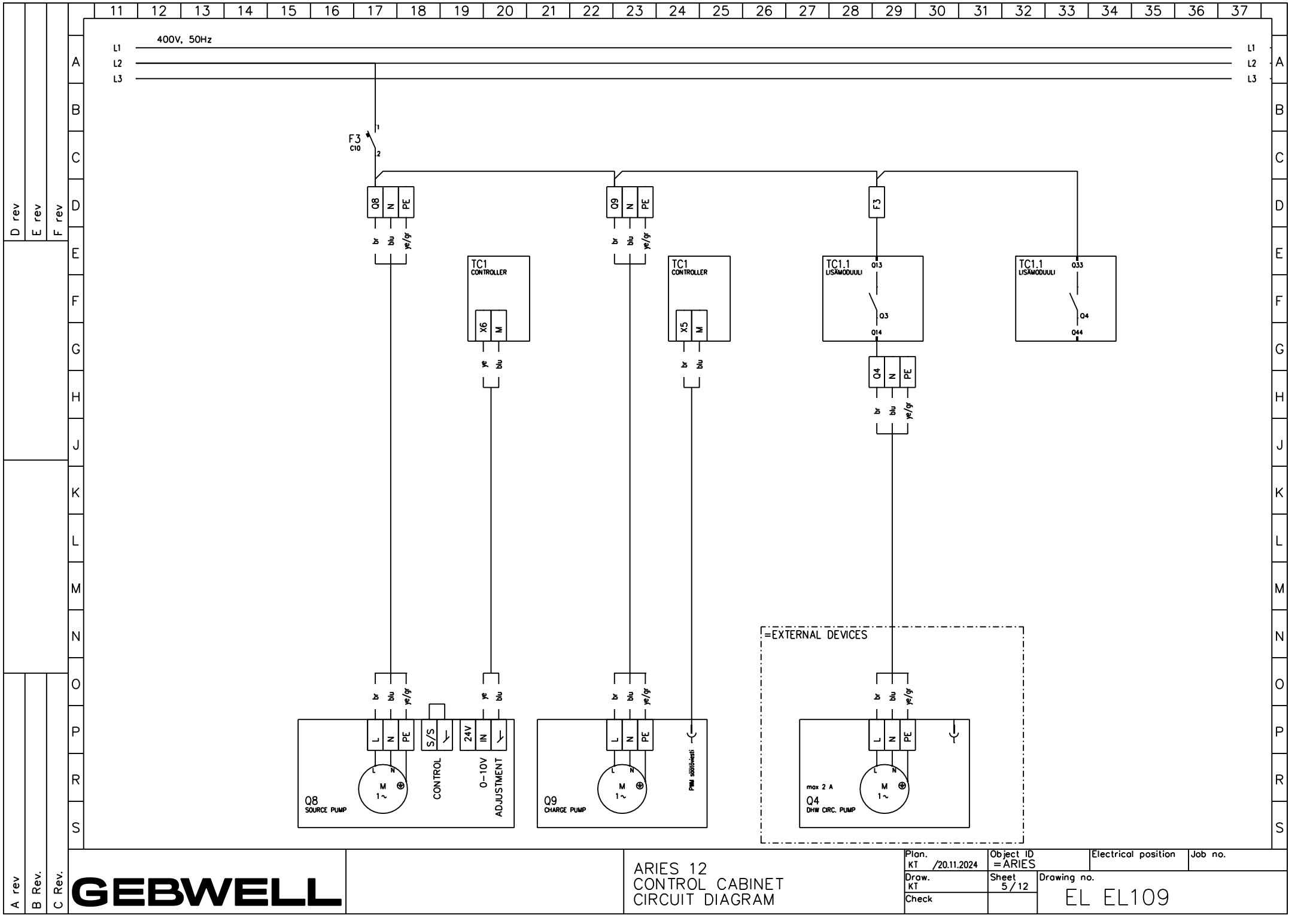


D rev
E rev
F rev
A rev
B Rev.
C Rev.

GEBWELL

ARIES 12
CONTROL CABINET
CIRCUIT DIAGRAM

Plan. EH /20.11.2024	Object ID =ARIES	Electrical position	Job no.
Draw. EH	Sheet 4 / 12	Drawing no. EL EL109	
Check			

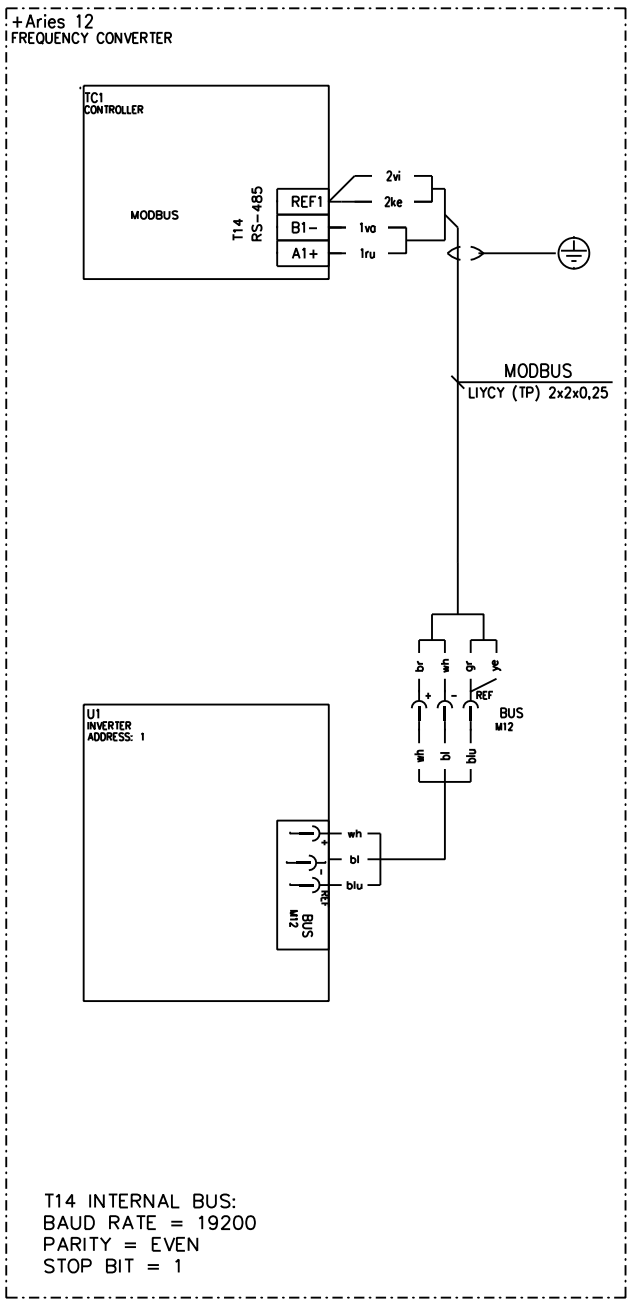


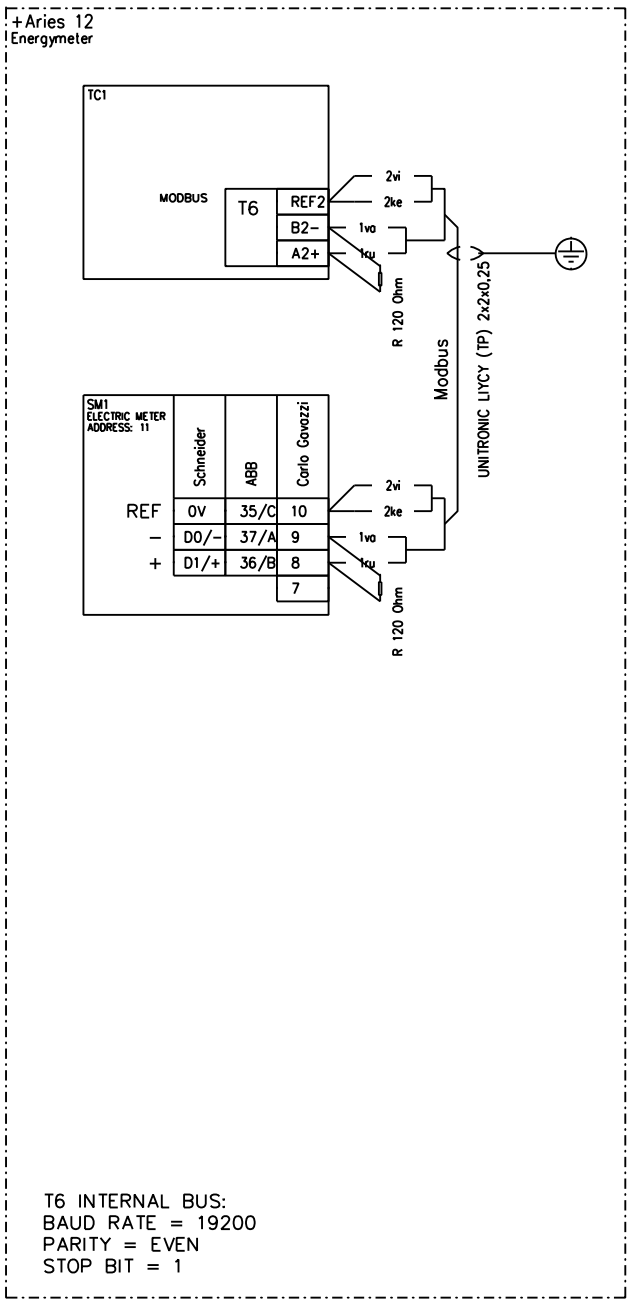
GEBWELL

ARIES 12
CONTROL CABINET
CIRCUIT DIAGRAM

Plan. KT /20.11.2024	Object ID =ARIES	Electrical position	Job no.
Draw. KT	Sheet 5/12	Drawing no. EL EL109	
Check			

A rev
B Rev.
C Rev.
D rev
E rev
F rev



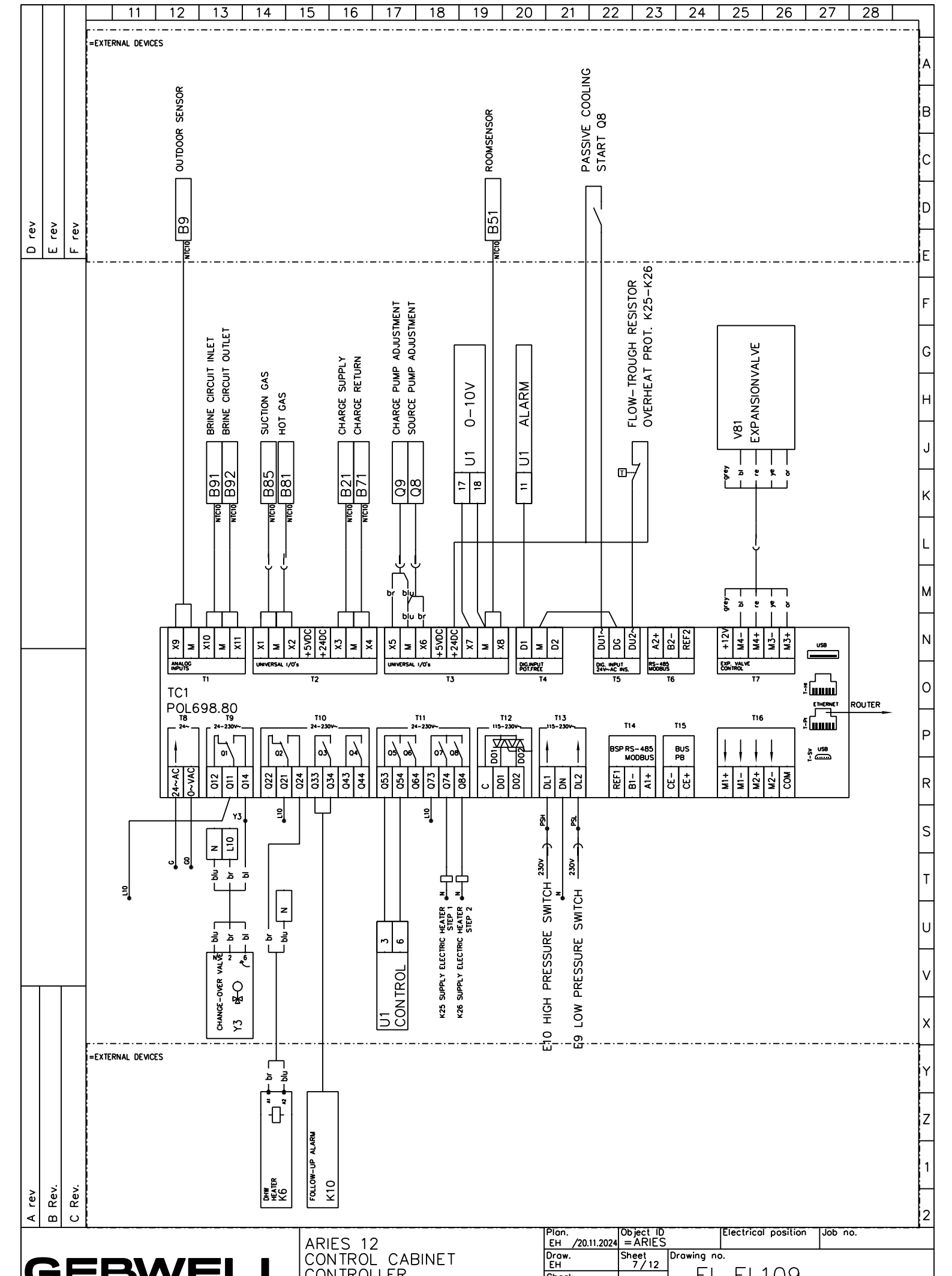


D rev
E rev
F rev
A rev
B Rev.
C Rev.

GEBWELL

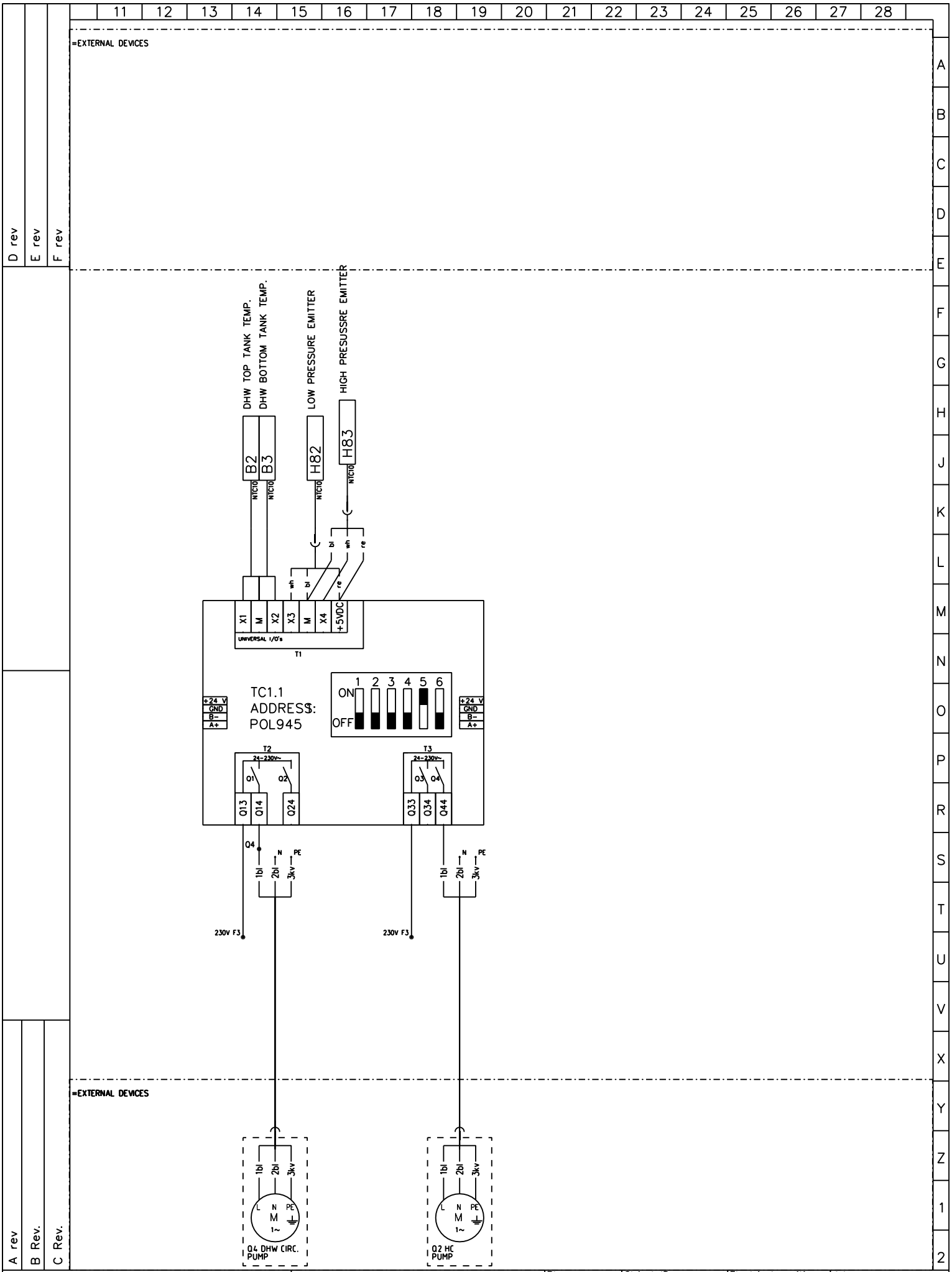
ARIES 12
MODBUS
INTERNAL BUS

Plan. KT /20.11.2024	Object ID =ARIES	Electrical position	Job no.
Draw. KT	Sheet 6/12	Drawing no. EL EL109	
Check			

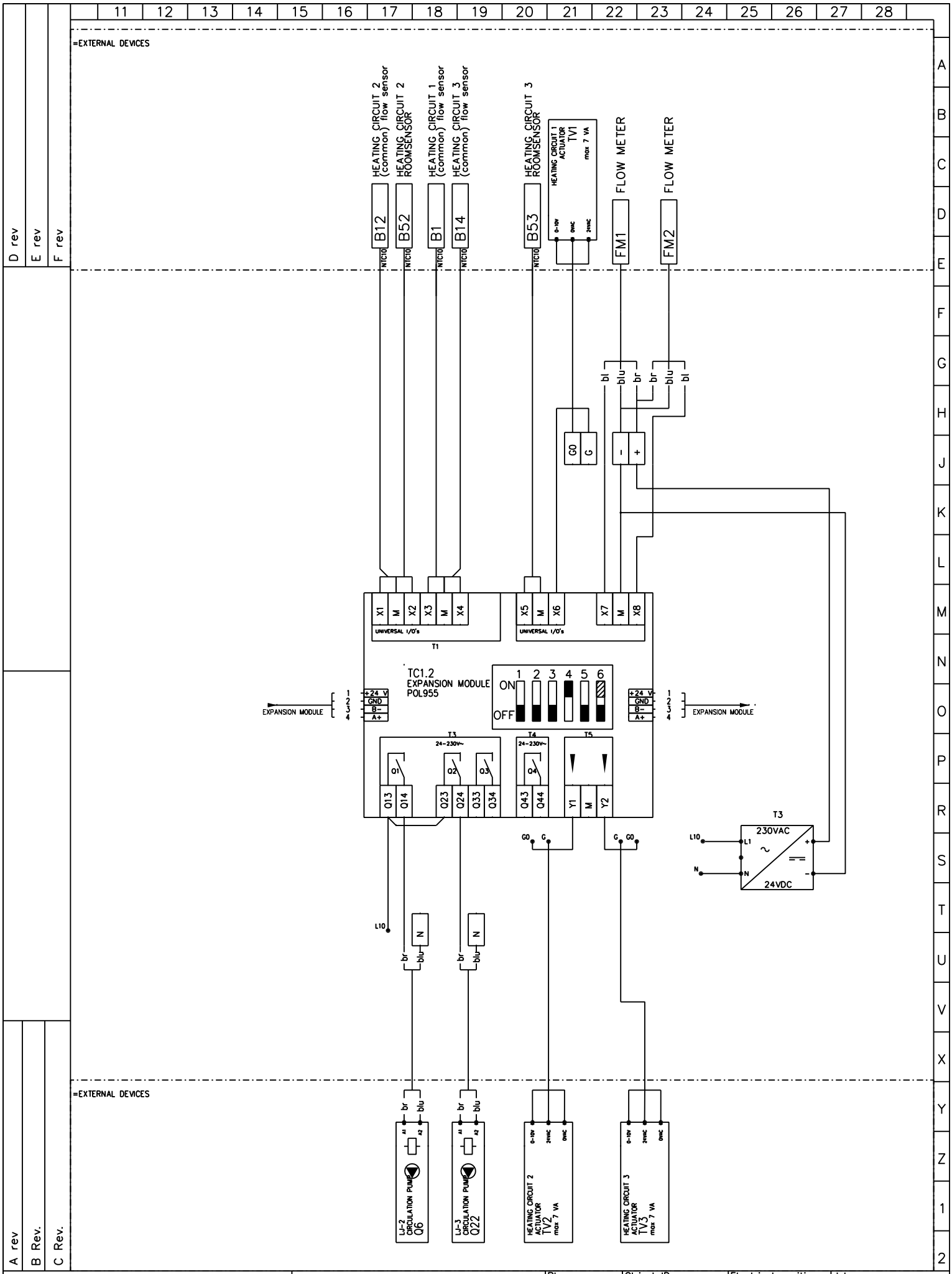


GEBWELL	ARIES 12 CONTROL CABINET CONTROLLER	Plan. EH /20.11.2024	Object ID =ARIES	Electrical position	Job no.
		Draw. EH	Sheet 7/12	Drawing no. EL EL109	
		Check			

D rev
E rev
F rev
A rev
B Rev.
C Rev.



GEBWELL	ARIES 12 CONTROL CABINET EXPANSION MODULE	Plan. EH /20.11.2024	Object ID =ARIES	Electrical position	Job no.
		Draw. EH	Sheet 8/12	Drawing no. EL EL109	
		Check			

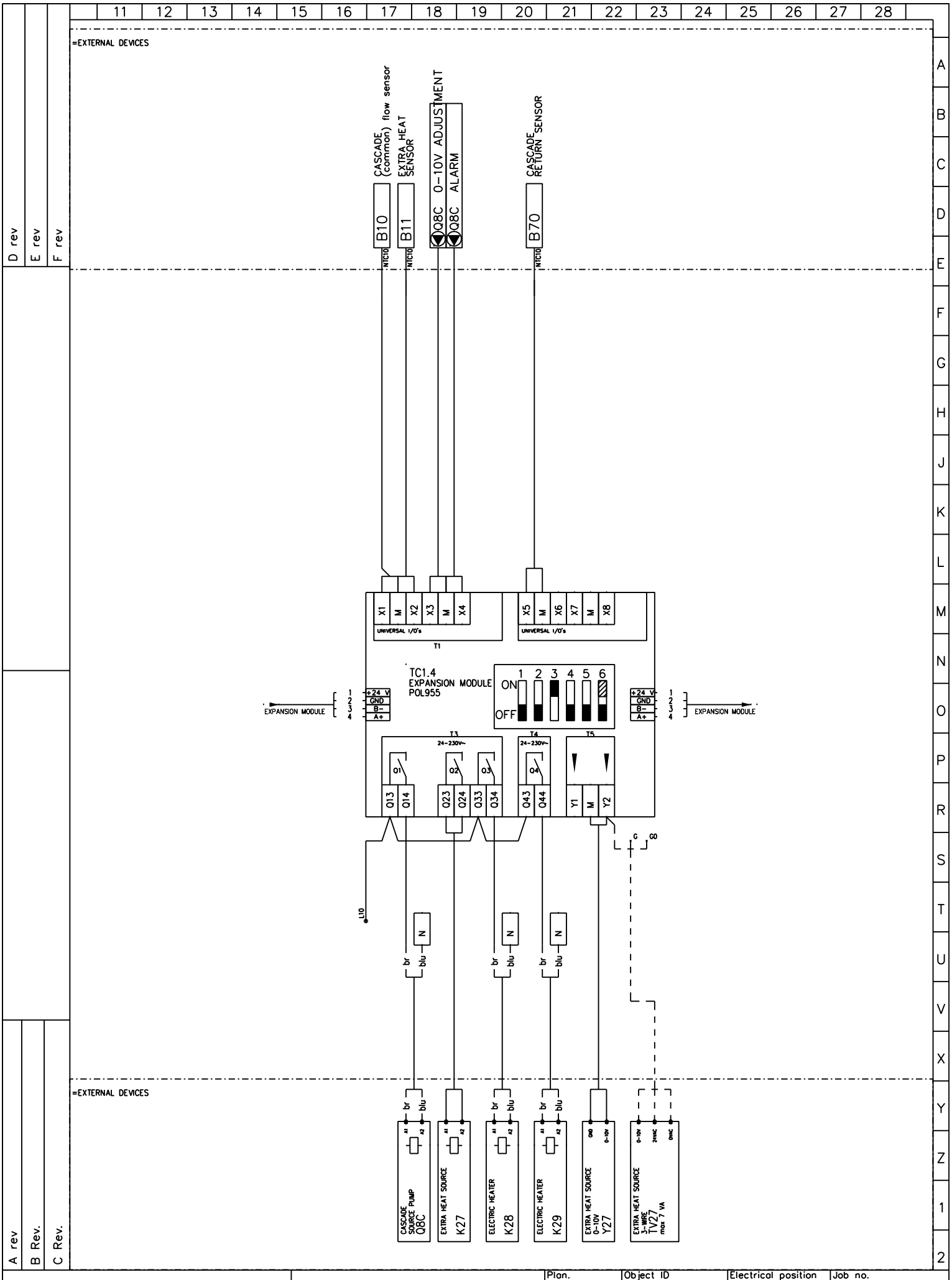


D rev
E rev
F rev
A rev
B Rev.
C Rev.

GEBWELL

ARIES 12
ACCESSORY
HC CONTROL

Plan.	Object ID	Electrical position	Job no.
EH /20.11.2024	=ARIES		
Draw. EH	Sheet 9/12	Drawing no. EL EL109	
Check			



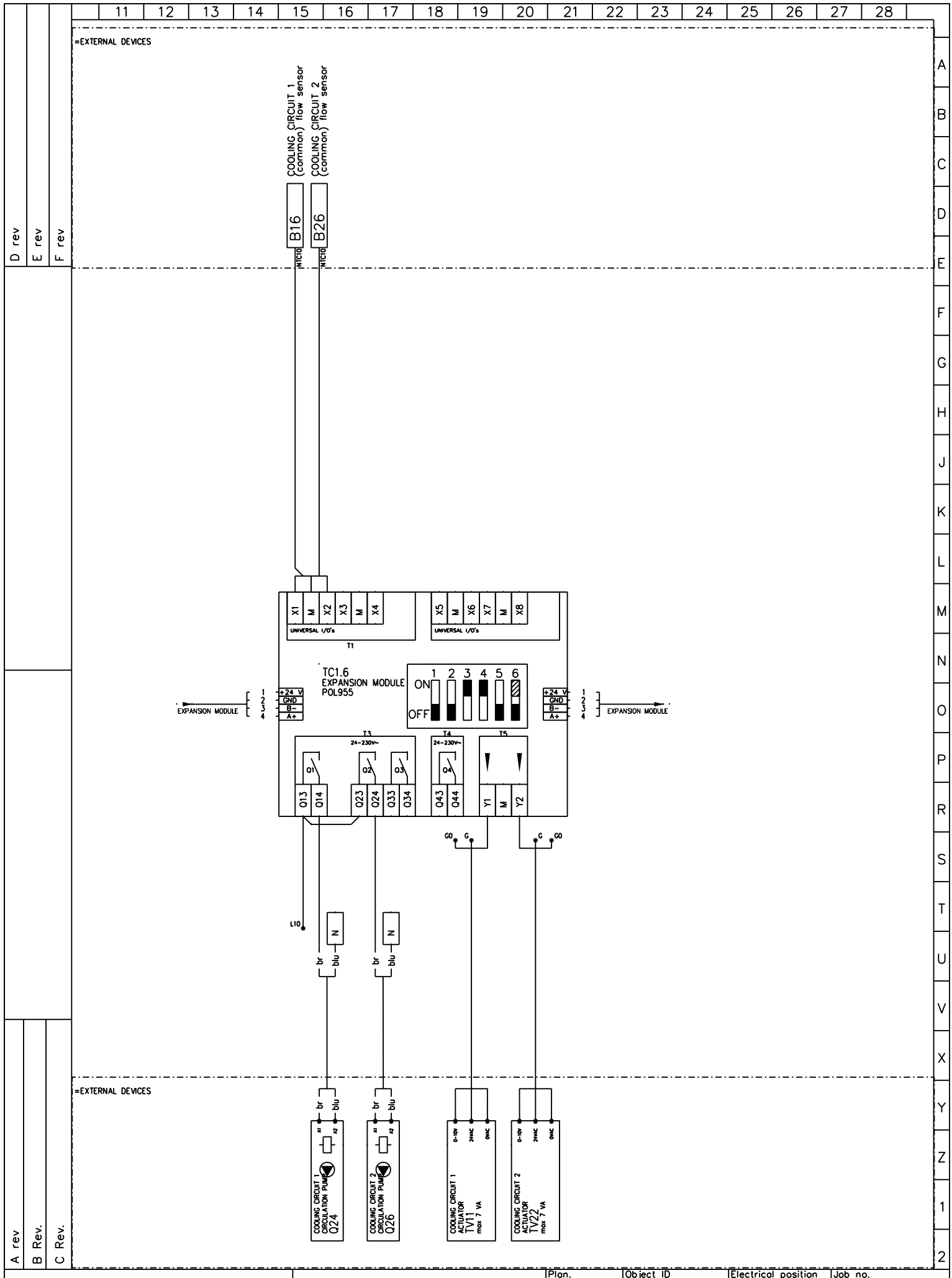
D rev
E rev
F rev

A rev
B Rev.
C Rev.

GEBWELL

ARIES 12
ACCESSORY
CASCADE & EXTRA HEAT

Plan.	Object ID	Electrical position	Job no.
EH /20.11.2024	=ARIES		
Draw. EH	Sheet 10/12	Drawing no. EL EL109	
Check			

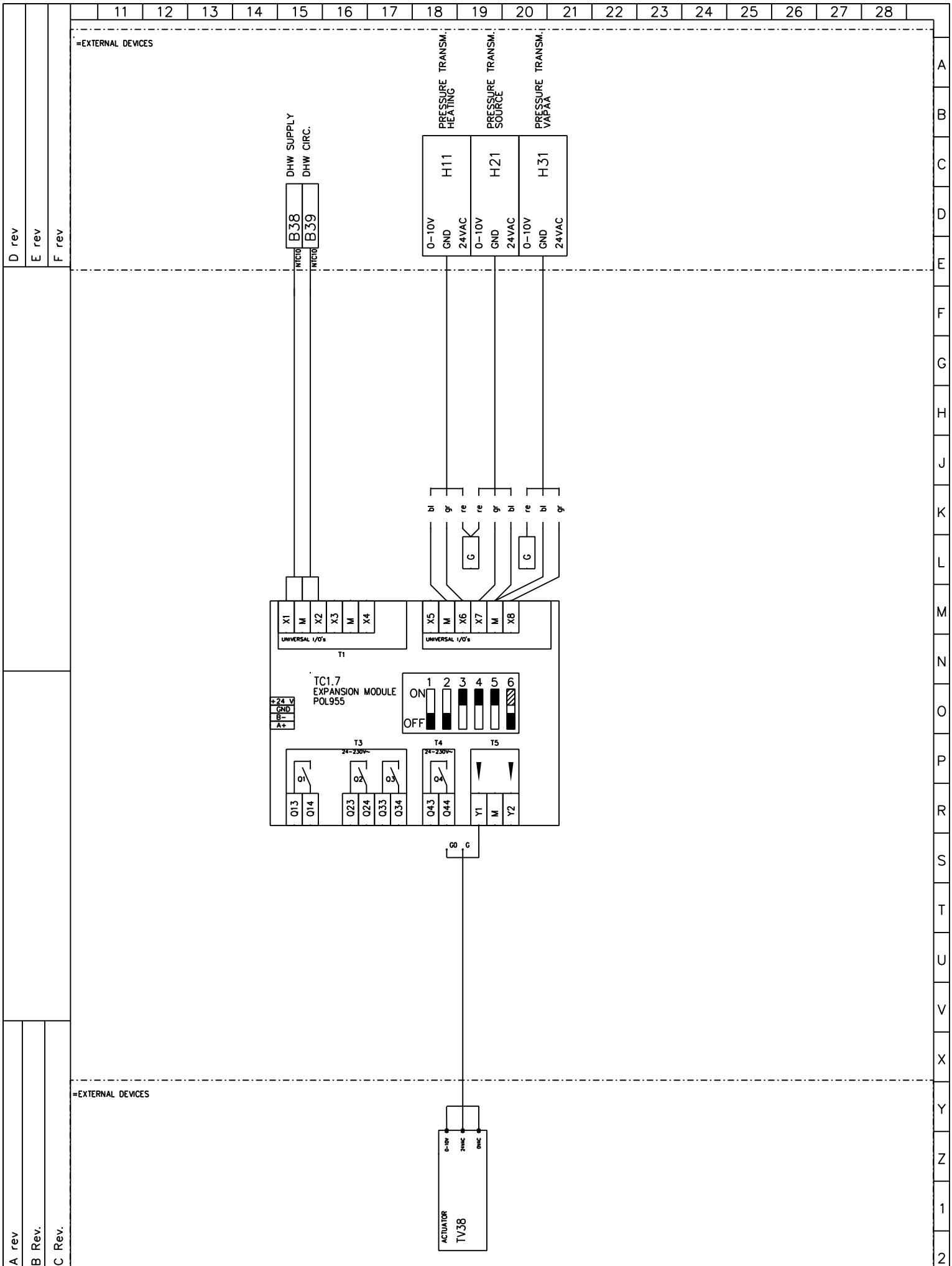


D rev
E rev
F rev
A rev
B Rev.
C Rev.

GEBWELL

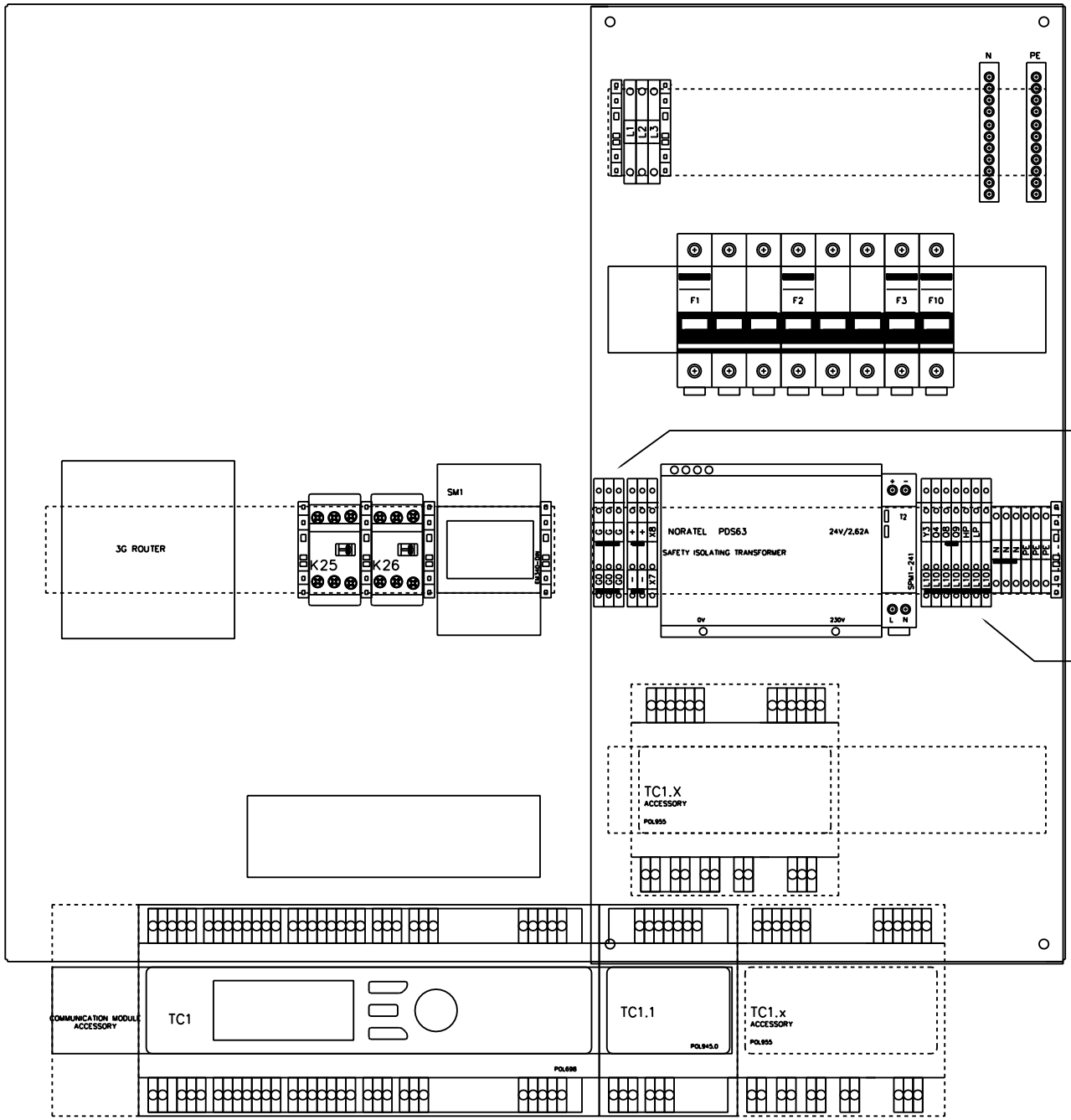
ARIES 12
ACCESSORY
COOLING CIRC. CONTROL

Plan.	Object ID	Electrical position	Job no.
EH /20.11.2024	=ARIES		
Draw. EH	Sheet 11/12	Drawing no. EL EL109	
Check			



D rev
E rev
F rev
A rev
B Rev.
C Rev.

GEBWELL	ARIES 12 ACCESSORY DHW CONTROL	Plan. EH /20.11.2024	Object ID =ARIES	Electrical position Job no.
		Draw. EH	Sheet 12/12	Drawing no. EL EL109
		Check		



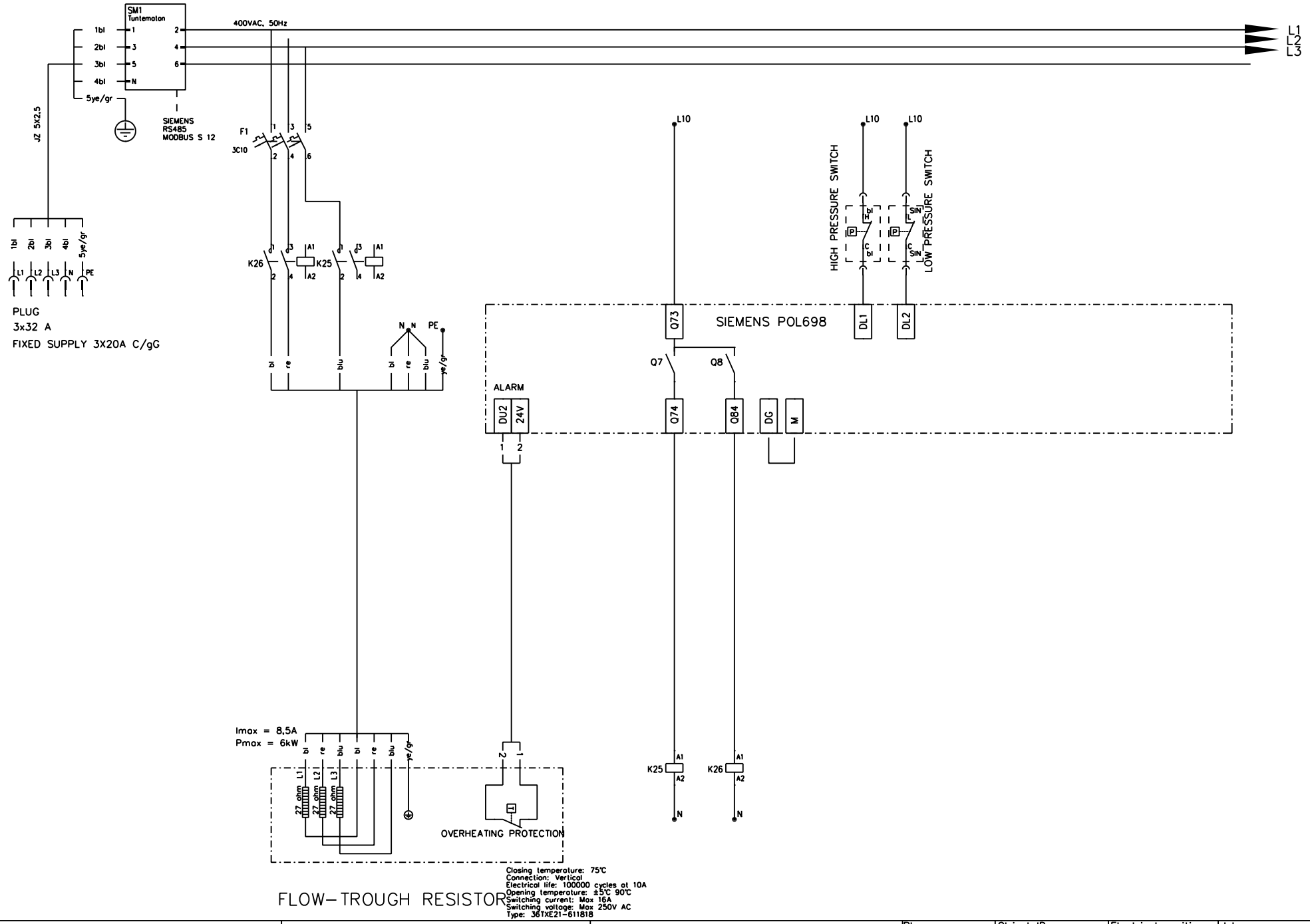
TECHNICAL DETAILS		
VOLTAGE	Un	400 V
CURRENT	In	3X20 A
CONTROL VOLTAGE	U	5-24V AC DC
CONTROL VOLTAGE	U	230V AC
IP-CATEGORY	IP	4X
MAX TEMPERATURE		35°C

GEBWELL

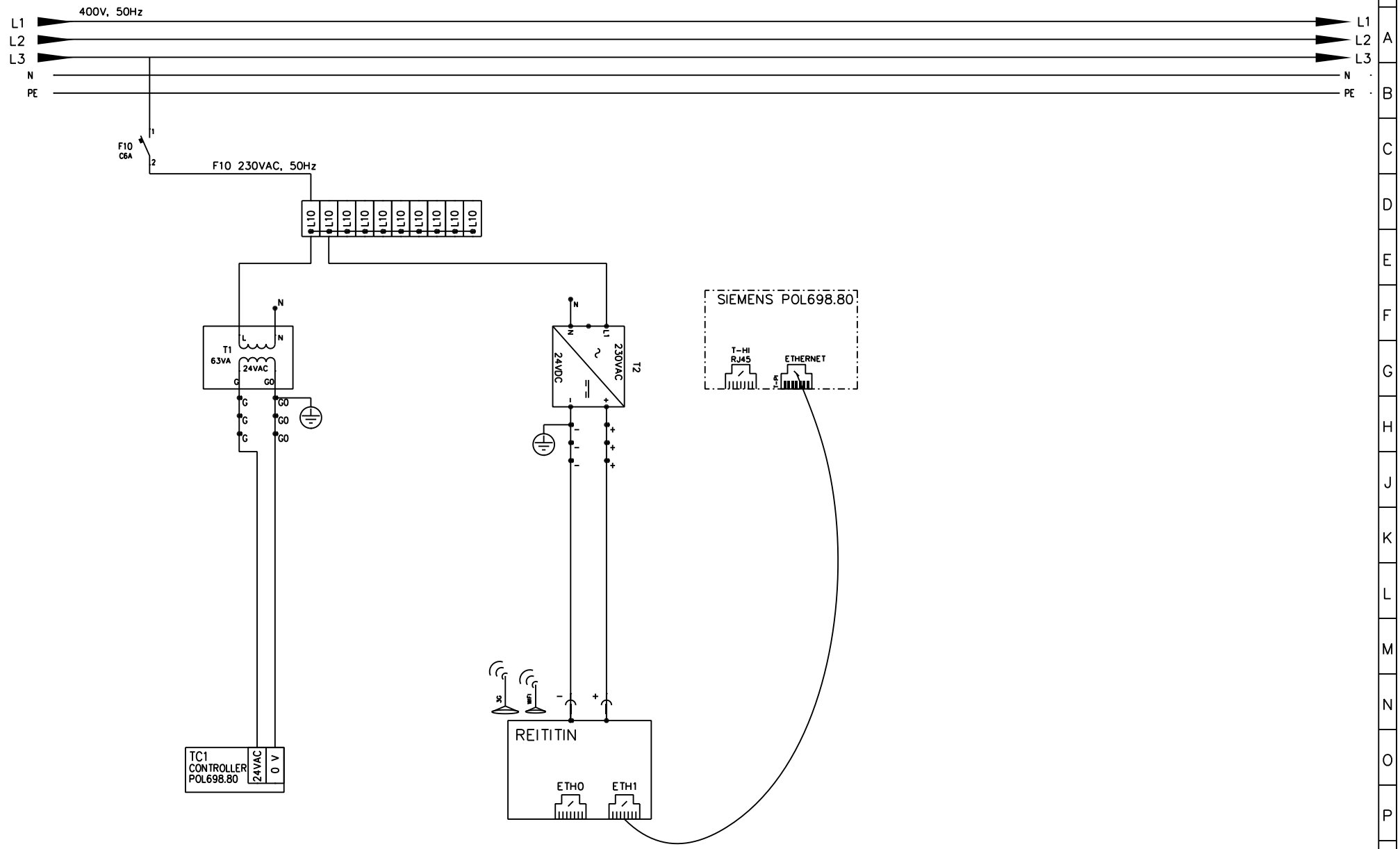
ARIES 12 C
CONTROL CABINET
LAYOUT

Plan.	Object ID	Electrical position	Job no.
KT /20.11.2024	=ARIES		
Draw.	Sheet 1/12	Drawing no. EL EL102	
Check			

D rev
E rev
F rev
A rev
B Rev.
C Rev.



GEBWELL	ARIES 12 C CONTROL CABINET CIRCUIT DIAGRAM	Plan. KT /20.11.2024	Object ID =ARIES	Electrical position	Job no.
		Draw.	Sheet 2/12	Drawing no. EL EL102	
		Check			

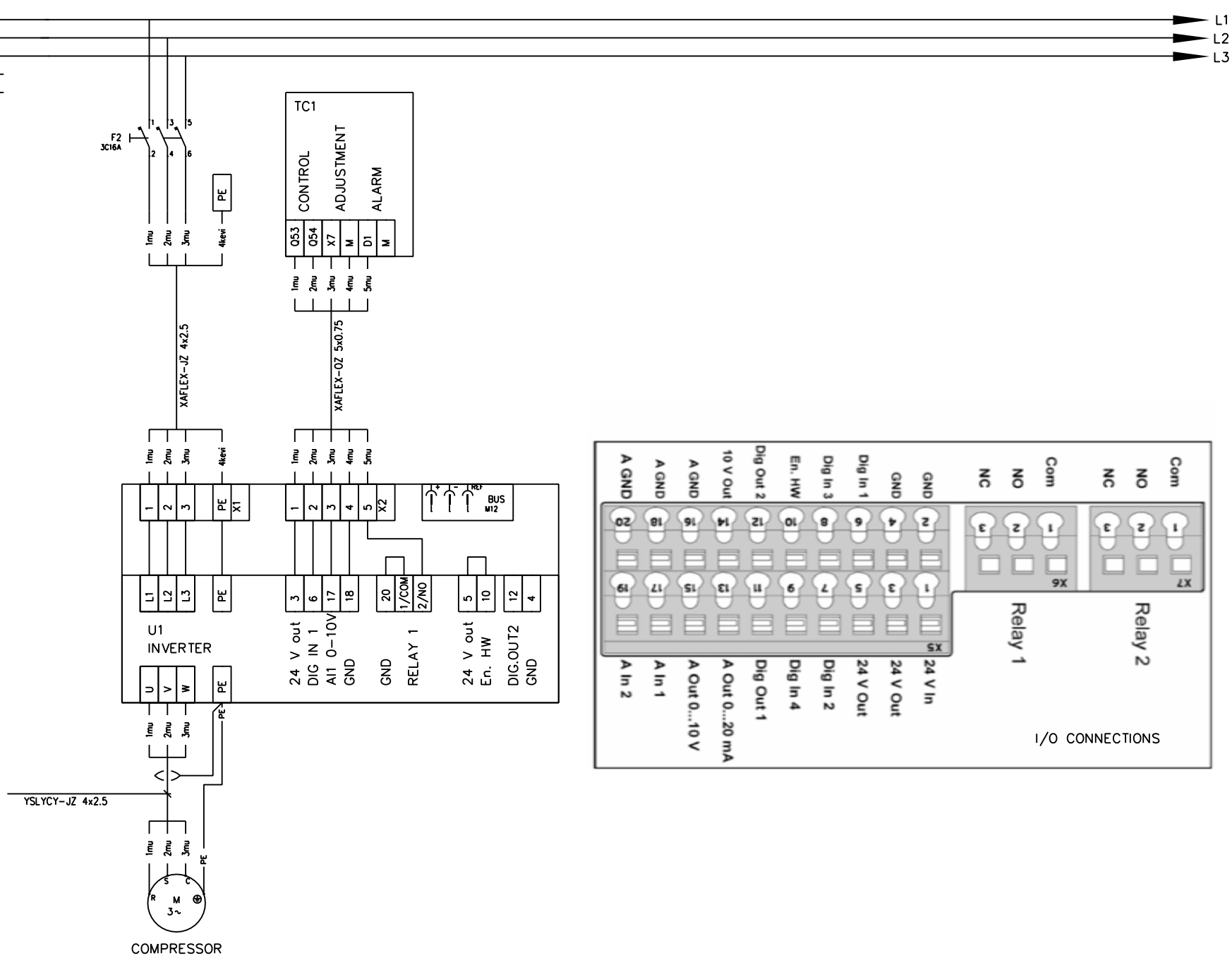


D rev
E rev
F rev
A rev
B Rev.
C Rev.

GEBWELL

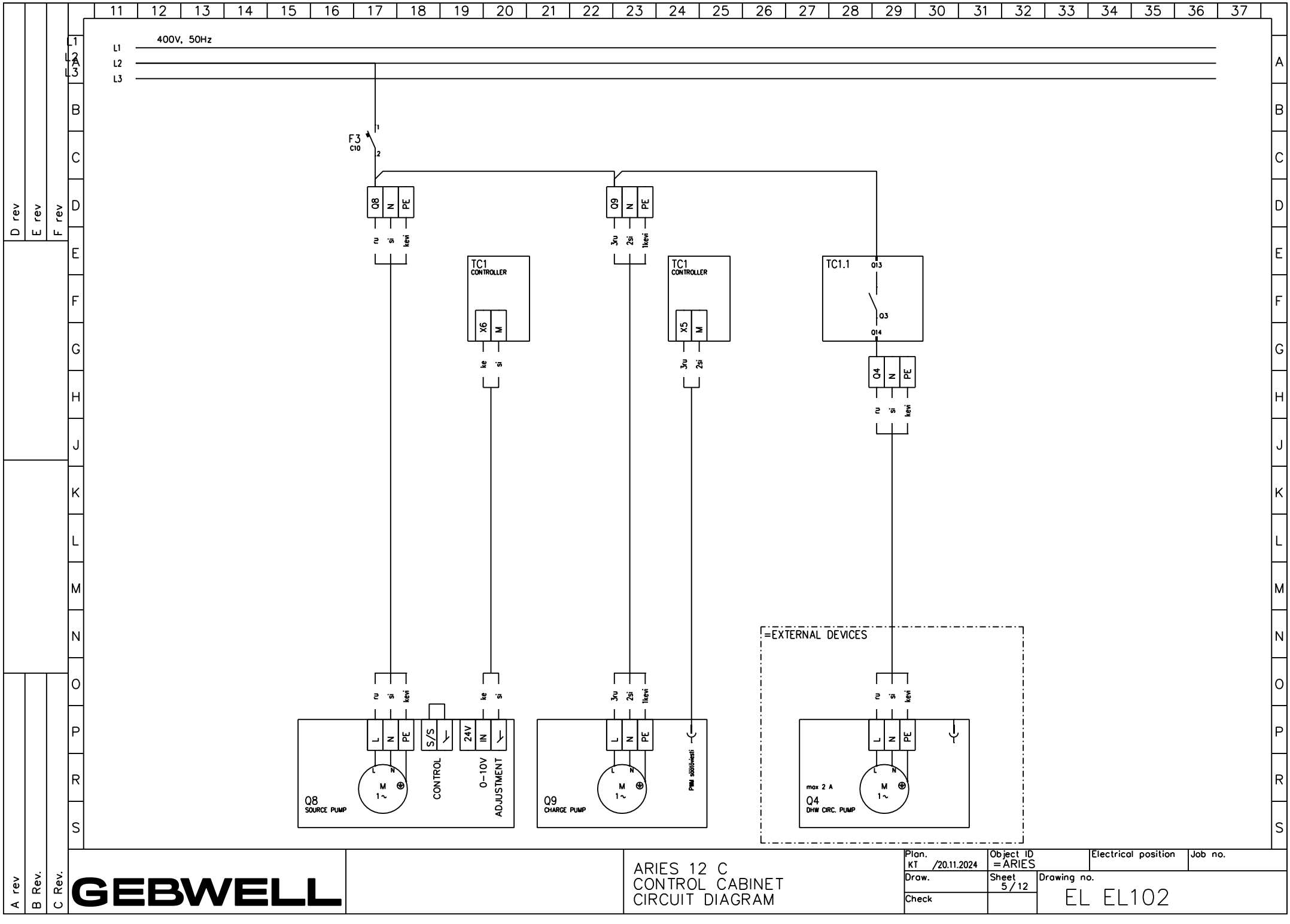
ARIES 12 C
CONTROL CABINET
CIRCUIT DIAGRAM

Plan.	Object ID	Electrical position	Job no.
KT /20.11.2024	=ARIES		
Draw.	Sheet 3/12	Drawing no. EL EL102	
Check			



GEBWELL	ARIES 12 C CONTROL CABINET CIRCUIT DIAGRAM	Plan. VHe /20.11.2024	Object ID =ARIES	Electrical position	Job no.
		Draw.	Sheet 4/12	Drawing no. EL EL102	
		Check			

A rev | B Rev. | C Rev. | D rev | E rev | F rev

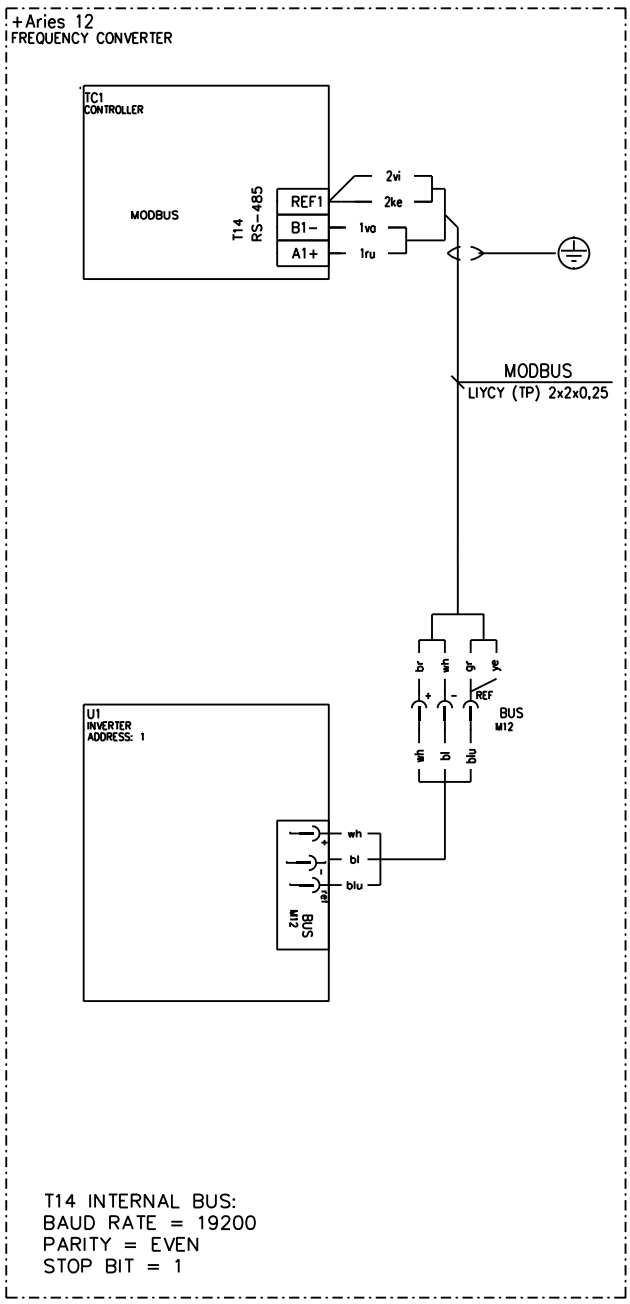


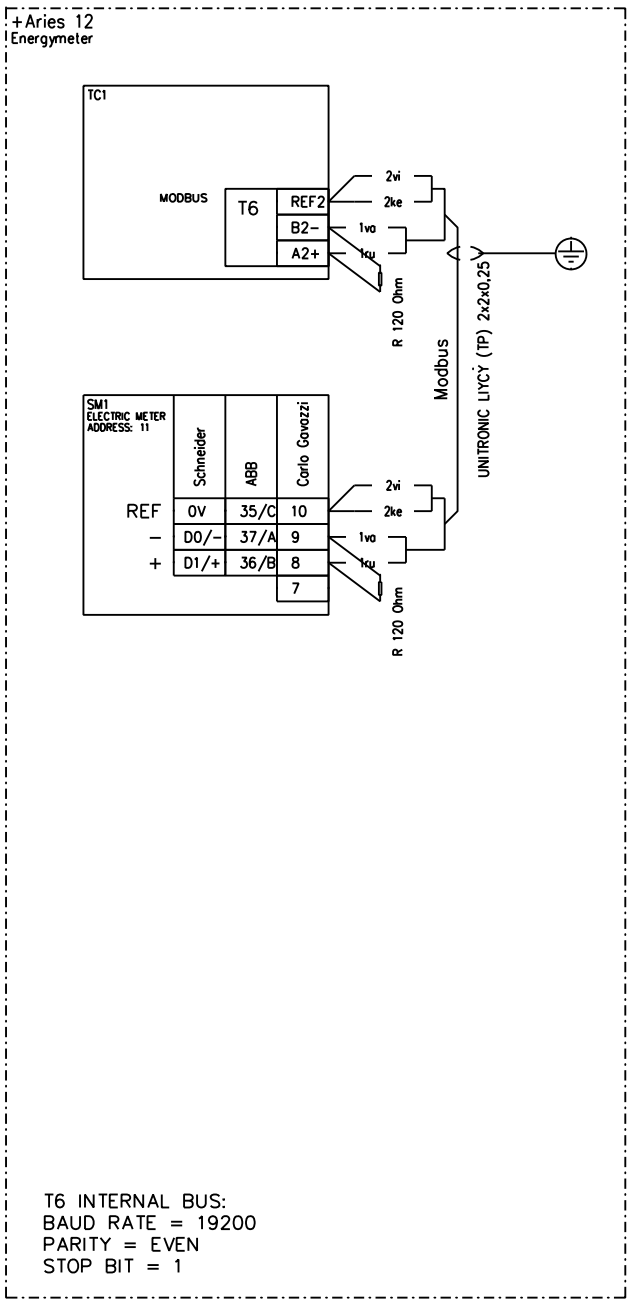
GEBWELL

ARIES 12 C
CONTROL CABINET
CIRCUIT DIAGRAM

Plan. KT /20.11.2024	Object ID =ARIES	Electrical position	Job no.
Draw.	Sheet 5/12	Drawing no. EL EL102	
Check			

D rev
E rev
F rev
A rev
B Rev.
C Rev.





T14 INTERNAL BUS:
BAUD RATE = 19200
PARITY = EVEN
STOP BIT = 1

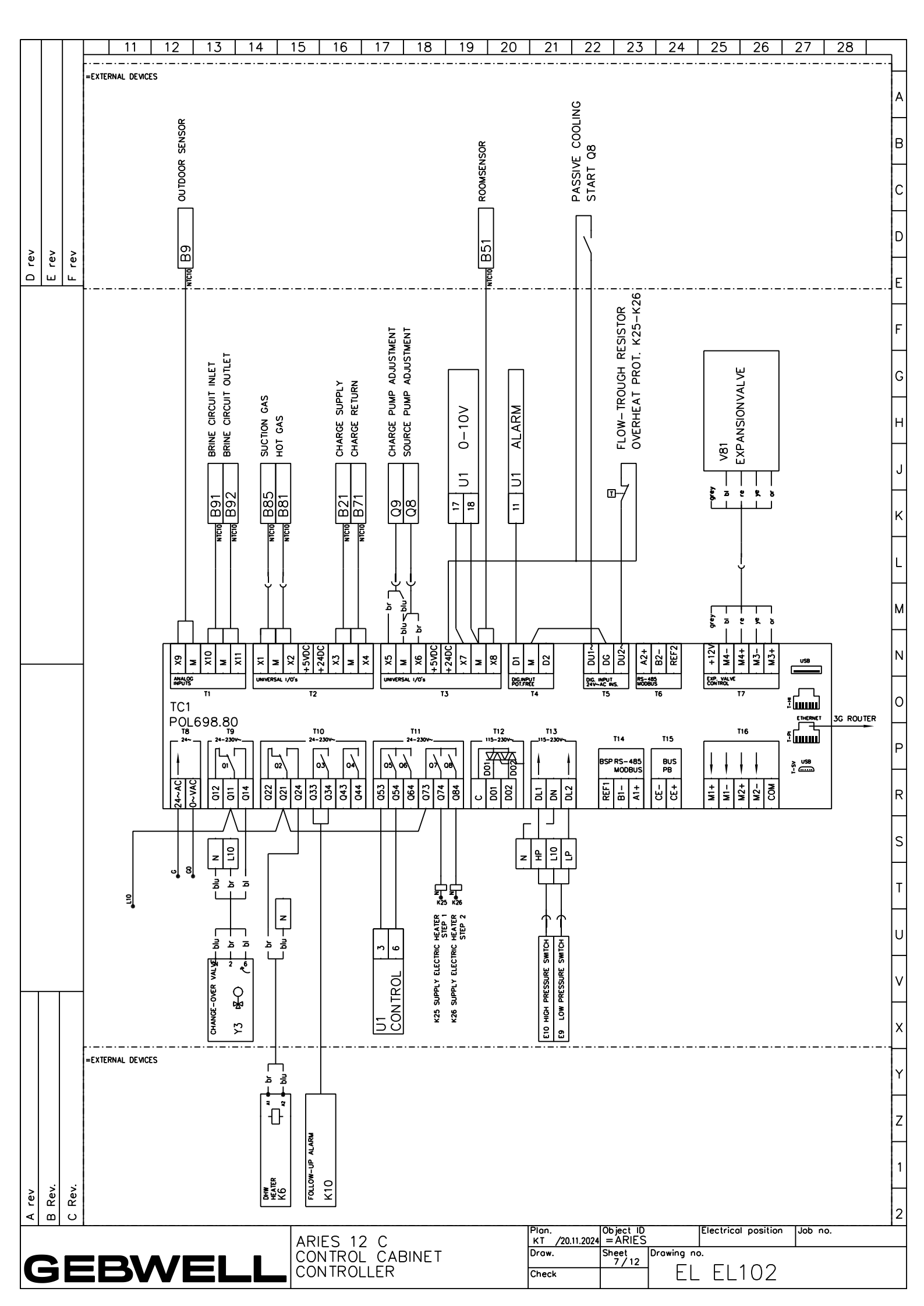
T6 INTERNAL BUS:
BAUD RATE = 19200
PARITY = EVEN
STOP BIT = 1

D rev
E rev
F rev
A rev
B Rev.
C Rev.

GEBWELL

ARIES 12 C
MODBUS
INTERNAL BUS

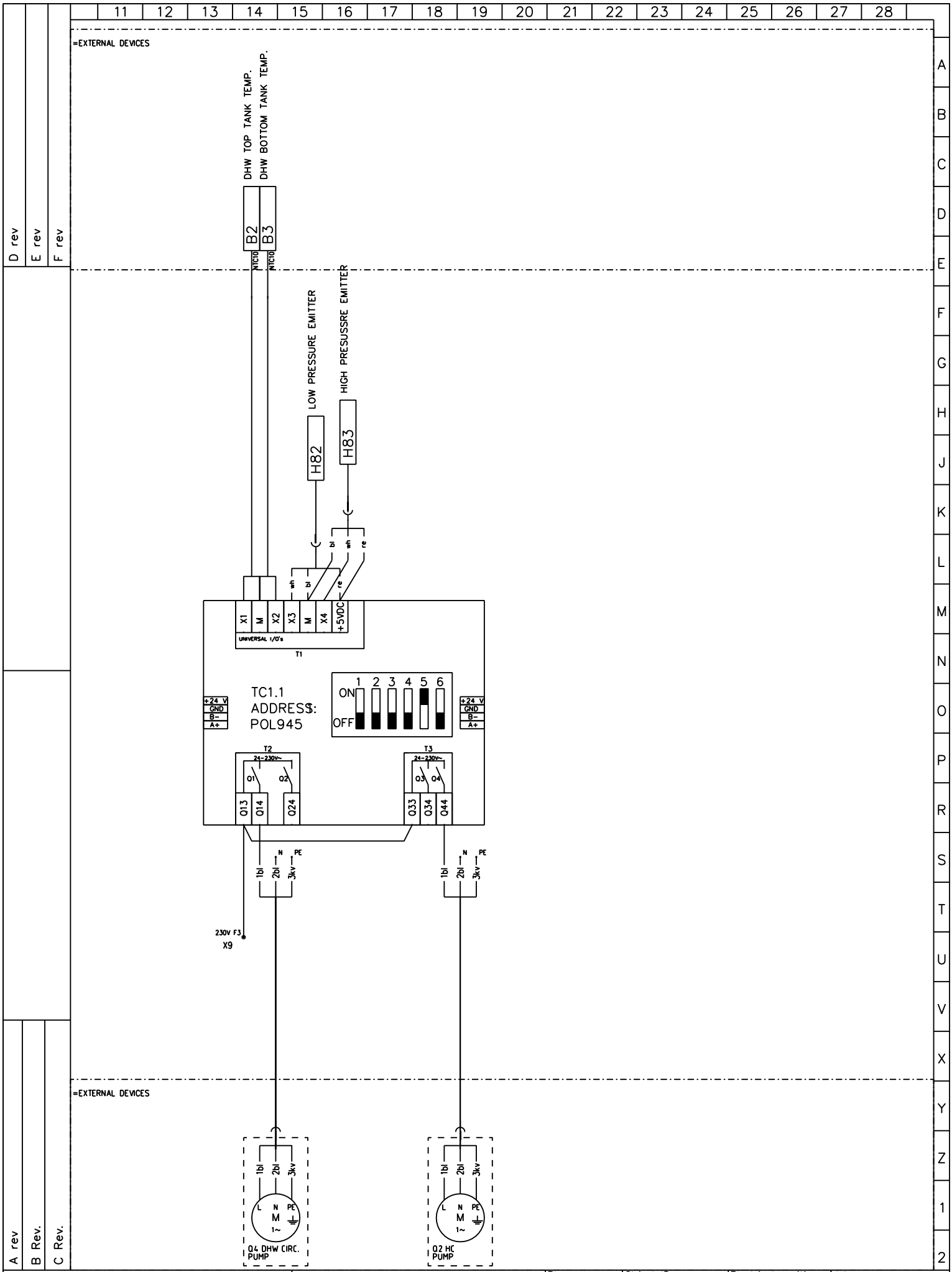
Plan. KT /20.11.2024	Object ID =ARIES	Electrical position	Job no.
Draw.	Sheet 6/12	Drawing no. EL EL102	
Check			



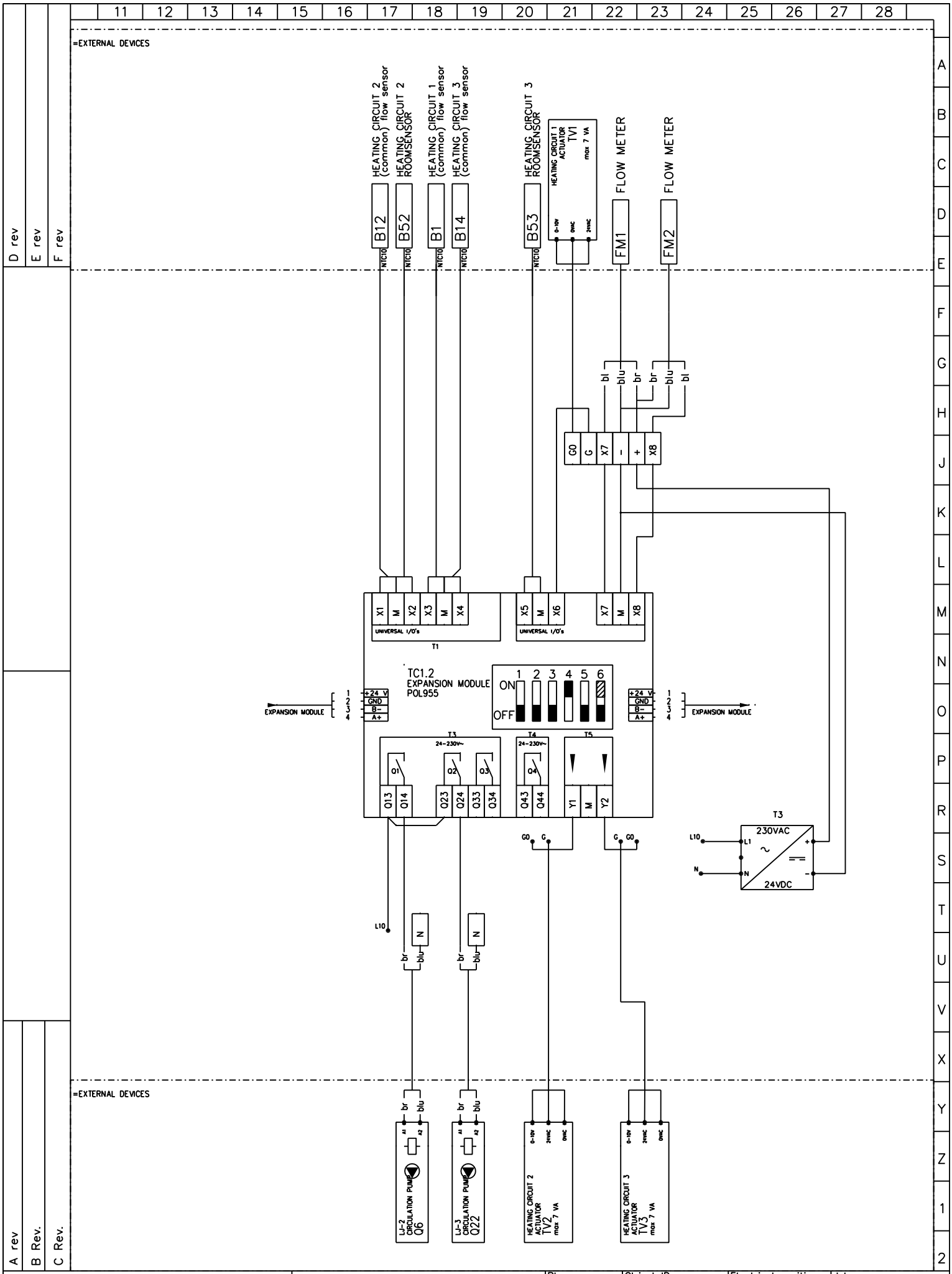
GEBWELL

ARIES 12 C
CONTROL CABINET
CONTROLLER

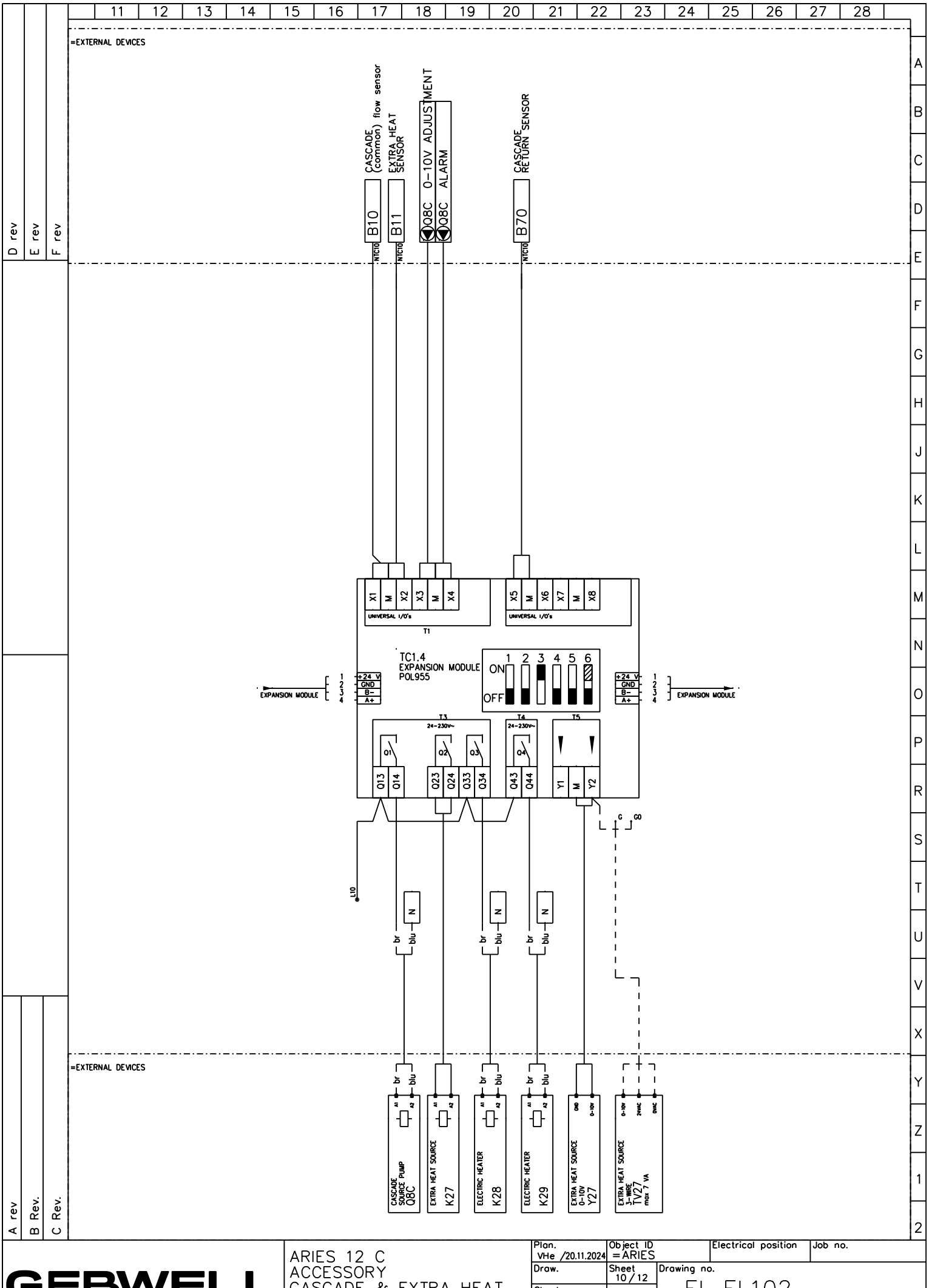
Plan.	Object ID	Electrical position	Job no.
KT /20.11.2024	=ARIES		
Draw.	Sheet 7/12	Drawing no. EL EL102	
Check			



GEBWELL	ARIES 12 C CONTROL CABINET EXPANSION MODULE	Plan. KT /20.11.2024	Object ID =ARIES	Electrical position	Job no.
		Draw.	Sheet 8/12	Drawing no. EL EL102	
		Check			



GEBWELL	ARIES 12 C ACCESSORY HC CONTROL	Plan. VHe /20.11.2024	Object ID =ARIES	Electrical position	Job no.
		Draw.	Sheet 9/12	Drawing no. EL EL102	
		Check			



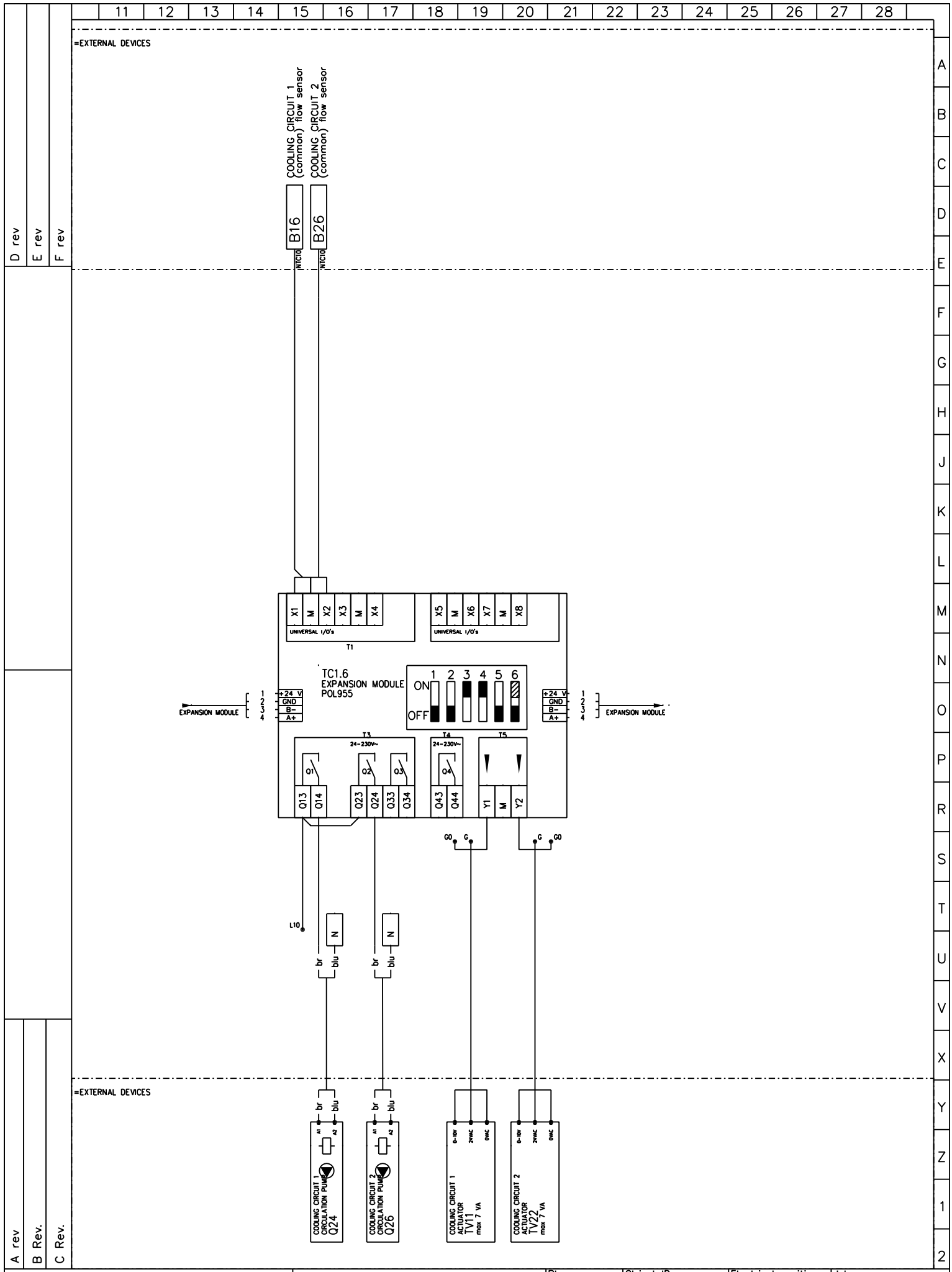
GEBWELL

ARIES 12 C
ACCESSORY
CASCADE & EXTRA HEAT

Plan.	Object ID	Electrical position	Job no.
VHe /20.11.2024	=ARIES		
Draw.	Sheet 10/12	Drawing no. EL EL102	
Check			

D rev
E rev
F rev

A rev
B Rev.
C Rev.

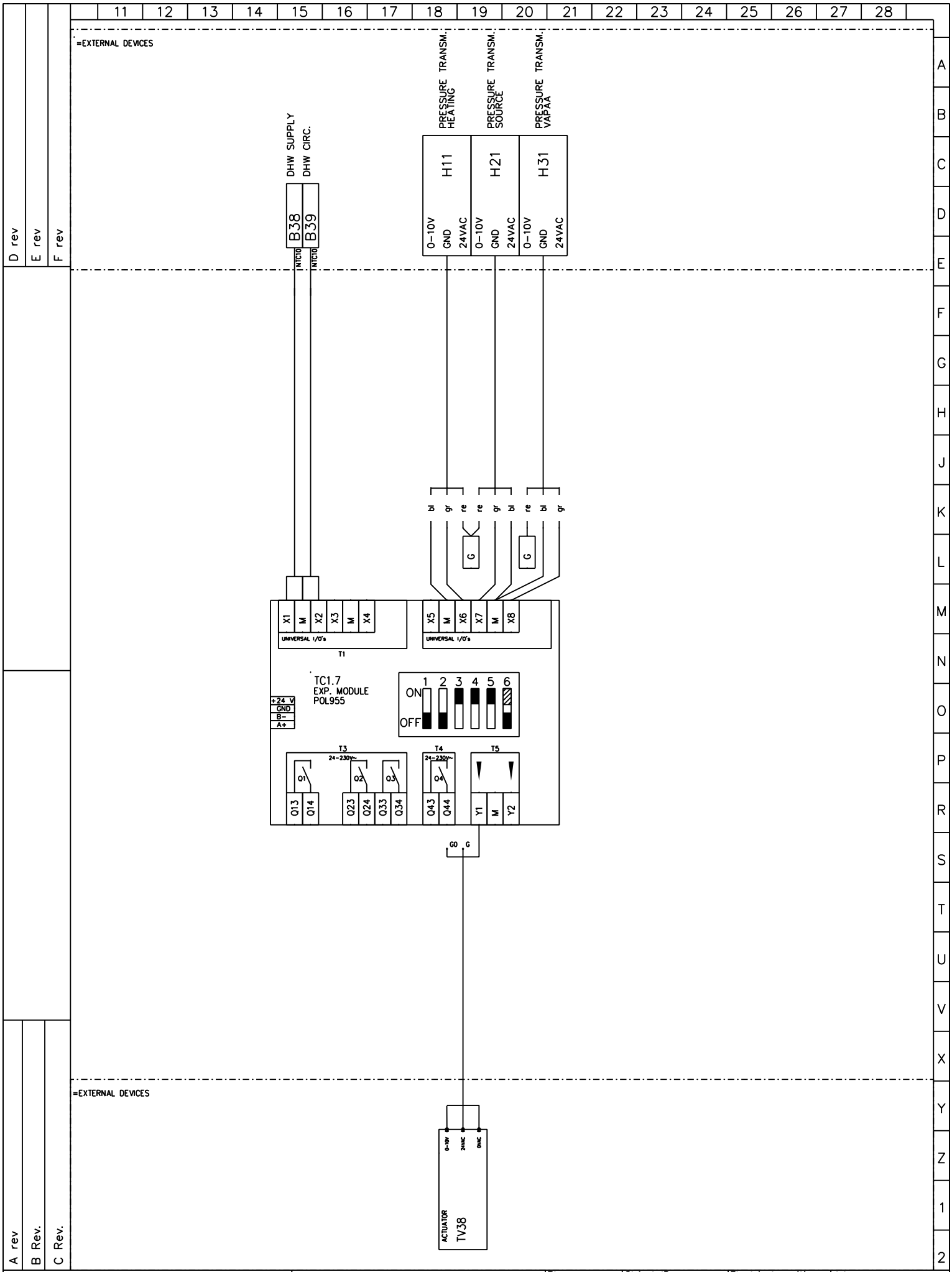


D rev
E rev
F rev
A rev
B Rev.
C Rev.

GEBWELL

ARIES 12 C
ACCESSORY
COOLING CIRC. CONTROL

Plan. VHe /20.11.2024	Object ID =ARIES	Electrical position	Job no.
Draw.	Sheet 11/12	Drawing no. EL EL102	
Check			



GEBWELL	ARIES 12 C ACCESSORY DHW CONTROL	Plan. VHe /20.11.2024	Object ID =ARIES	Electrical position	Job no.
		Draw.	Sheet 12/12	Drawing no. EL EL102	
		Check			

Gebwell CLI control menu structure

► Main menu	► Heat pump
	► Domestic hot wateri
	► Heat circuit 1-3
	► Cool circuit 1
	► Information
	► Service menu

Heat pump

► Heat pump	**► System clock**	Year	
		Month	
		Day	
		Houri	
		Minute	
		Second	
	Language selection		*suomi, English, svenska*
	HP operating mode		*Auto, Off, Backup heat*
	Alarm acknowledge		*Execute*

Domestic hot water

► Domestic hot water	**Status**		Value is read-only
	DHW operating mode		*Auto, Off/Prt, Recuced, Comfort*
	Top temp. tank		Value is read-only
	Bottom temp. tank		Value is read-only
	Change over valve		Value is read-only
	► DHW SP temperatures	Actual	*˚C*, Value is read-only
		Comfort	*˚C*
		Reduced	*˚C*
	► Legionella	Setp.temperature	*˚C*
		Legionella mode	*Mo,Tu,We,Th,Fr,Sa,Su*
		Start time leg.function	*h*
	Circulation pump		Value is read-only

Heat circuit 1-3

► Heat circuit 1-3	**HC operating mode**		*Auto, Off/Prt, Recuced, Comfort*
	► Sp.room temp.	Actual	*˚C*
		Comfort	*˚C*
		Reduced	*˚C*
		Protect	*˚C*
		Sp.correction	*K*
		Room temp. control	Value is read-only
		Room temp. comp.	
		Ti room	*min*
		Room influence	*K*, Value is read-only
	► Heating curve	Out.temp.filtered. X	*˚C*
		X1	*-30˚C*, Value is read-only
		Y1	*˚C*
		X2	*-15˚C*, Value is read-only
		Y2	*˚C*
		X3	*0˚C*, Value is read-only
		Y3	*˚C*
		X4	+10*˚C*, Value is read-only
		Y4	*˚C*
		X5	*+20˚C*, Value is read-only
		Y5	*˚C*
		Heating curve Y	*˚C*, Value is read-only
	► Setpoint flow temp.	Present value	*˚C*, Value is read-only
		High limit	*˚C*
		Low limit	*˚C*
	Summer-winter switch temperature		*˚C*
	► Week calender HC1	Present value	Value is read-only
		Monday	*Time-1* *Value-1: Off/Pro., Comfort, Eco* . . . . . *Time-6* *Time-6: Off/Pro., Comfort, Eco*
		Tuesday	
		Wednesday	
		Thursday	
		Friday	
		Saturday	
		Sunday	

► Heat circuit 1-3	**► Week calender HC1**	Exception	
		Start time	*Day of week, Day, Month, Year*
		End time	*Day of week, Day, Month, Year*
		Selection-1	*Day, Area, Day of week, Calendar*
		(Start)day	*Day of week, Day, Month, Year*
		End day	*Day of week, Day, Month, Year*
		Weekday	*Day of week, Day, Month, Year*
	Copy schedule		*Ma to, Tu-Fr, Tu-Su, Tu, We, Th, Fr, Sa, Su, Ecpt*

Cool circuit

► Cool circuit	**Op.mode HMI**		*Auto, Off/Prt, Recuced, Comfort*
	► Sp.room temp.	Actual	*˚C*
		Comfort	*˚C*
		Reduced	*˚C*
		Sp. correction	*K*
		Room temp. control	Value is read-only
		Room temp. comp.	
		Ti room	*min*
		Room influence	*K,* Value is read-only
	►Cooling curve	Out.temp.filtered X	*˚C*
		X1	*15˚C,* Value is read-only
		Y1	*˚C*
		X2	*20˚C,* Value is read-only
		Y2	*˚C*
		X3	*25˚C,* Value is read-only
		Y3	*˚C*
		X4	30*˚C,* Value is read-only
		Y4	*˚C*
		X5	35*˚C,* Value is read-only
		Y5	*˚C*
		Cooling curve Y	Value is read-only
	► Setpoint flow temp.	Present value	*˚C,* Value is read-only
		High limit	*˚C*
		Low limit	*˚C*

	Su/Wi Temperature		*˚C*
	► Viikkokalenteri JP1	Present value	Value is read-only
		Monday	*Time-1* *Value-1: Off/Pro., Comfort, Eco* . . . . . *Time-6* *Time-6: Off/Pro., Comfort, Eco*
		Tuesday	
		Wednesday	
		Thursday	
		Friday	
		Saturday	
		Sunday	
		Exception	
		Start time	*Day of week, Day, Month, Year*
		End time	*Day of week, Day, Month, Year*
		Selection-1	*Day, Area, Day of week, Calendar*
		(Start)day	*Day of week, Day, Month, Year*
		End day	*Day of week, Day, Month, Year*
		Weekday	*Day of week, Day, Month, Year*
	Copy schedule		*Ma to, Tu-Fr, Tu-Su, Tu, We, Th, Fr, Sa, Su, Ecpt*

Information

► Information	► Status data and measurements	Outside temp.	˚C, Value is read-only
		Supply pump	%, Value is read-only
		Flow temp.	˚C, Value is read-only
		Return temp.	˚C, Value is read-only
		dT supply	*K*, Value is read-only
		Source pump	%, Value is read-only
		Source temp.	˚C, Value is read-only
		Return temp.source	˚C, Value is read-only
		dT source	*K*, Value is read-only
		Operating mode	Value is read-only
		Request	*%*, Value is read-only
		Present capacity	*%*, Value is read-only
		Compressor 1	*On*, Value is read-only
		VSD Compr. 1	*%*, Value is read-only
		Heat circuit 1	
		HC operating mode	*Auto, Off/Prt, Recuced, Comfort*
		Oprating mode	Value is read-only
		+Room temp.	˚C, Value is read-only
		+Flow temp.	˚C, Value is read-only
		Set point	˚C, Value is read-only
		Heat circuit 2	
		…..	
		Domestic hot water	
		DHW operating mode	*Auto, Off/Prt, Recuced, Comfort*
		Operating mode	Value is read-only
		Change over valve	Value is read-only
		Top temp. tank	˚C, Value is read-only
		Bottom temp. tank	˚C, Value is read-only
		Legionella mode DHW	Value is read-only
		Additional heat	
		K27 command	Value is read-only
		Control mode Add. heat	*HPErr, Parallell*
		Heat. ele. heater	Value is read-only
		Add. heat control signal	*%*, Value is read-only

► **Information**	► **Status data and measurements**	Setpoint	*˚C,* Value is read-only
		Present value	*˚C,* Value is read-only
		Control output	*%,* Value is read-only
	► **Operating hours,** Values read-only	Automation stat.	*h*
		Compressor 1	*h*
		Compressor start-ups	
		Hot water charges	
		Supply pump	*h*
		Source pump	*h*
		El.heater Add. heat	*h*
		El.heater start-ups Add.heat	
		K27 command Add. heat	*h*
		K27 start-ups Add. heat	
	► **Energy,** Values read-only	Energy total	*kWh*
		Generated heat total	*kWh*
		Energy heating	*kWh*
		Energy DHW	*kWh*
		Generated heat Heat.circuit	*kWh*
		Generated heat dhw	*kWh*

Service menu

► **Service menu**	► **Funtion testing**	Change over valve			*Heating, DHW*
		Source pump			*%*
		Source pump			*%*
		Charge pump			*%*
		Circulation pump DHW			*Off, On*
		DHW Ele. heat			*Off, On*
		Flow through heater			*Auto, Off, St 1-3*
		Valve HC2			*%*
		Valve HC3			*%*
		El.heater Add. heat			*Auto, Off, St 1-3*
		Add. heat			*Off, On*
		Add. heat control signal			%

► **Service menu**	► **Measurements** (Values read-only)	+Circuit 1			
		Cond.press.			*bar*
		Evap.press.			*bar*
		Cond. temp.			*˚C*
		Evaporatr temp.			*˚C*
		Suct.gas temp.			*˚C*
		Superheat			*K*
		Capacity request			*%*
		Present capacity			*%*
		Compressor 1			
		VSD Compressor 1			*%*
		Compressor 2			
		VSD Compressor 2			*%*
		Discharge templ.			*˚C*
		Feedb.esxp.val.			*%*
		+EXD-TEVI			
		Valve			*%*
		SuctionT1			*˚C*
		Superheat			*K*
		HotGasT1			*˚C*
		HotGasT2			*˚C*
		Pressure			*bar*
		Supply pump			*%*
		Flow temp.			*˚C*
		Return temp.			*˚C*
		dT supply			*K*
		Source pump			*%*
		Source temp			*˚C*
		Return temp. source			*˚C*
		dT source			*K*
		Flow temp. System			*˚C*
		Ext. control			
		Ext. heat demand			*%*
		Ext. setpoint			*˚C*

► Service menu	**► Commissioning**	Restart			*Execute*
		► Heat circuit 1-3	Heat circuit 1-3		*Enable, Disable*
			Room sensor		*Disabled, Wired, Wireless 1, Wireless 2, Wireless 1&2*
		► Cool circuit 1	Cool circuit 1		*Enable, Disable*
			Room sensor		*Disabled, HC1, HC2*
			Transfer pump (Q28)		*Enable, Disable*
		► Flow through heater	Flow through heater		*Enable, Disable*
			Number of stage		*One, Two, Three*
		► Additional heat	+K27/TV27		
			Add.heat		*Enable, Disable*
			+K28/K29		
			Heat. ele. heater		*Enable, Disable*
		► Cascade settings	Heat pump type		*Independent, Master, Slave1*
			Number of slaves		*0, 1*
			Common source pump type		*None, 1-stage, 0-10V*
		► Wiresell sensors	Nr. of wireless sensors		
			Addr. wireless base station		
			► Modbus	+Inbuilt RS485:2	
				Baud rate	*9600, 19200, 38400, 57600, 115200*
				Parity	*Even, Odd, None*
				Stop bits	*One, Two*
		► Ext.heat demand	Supl. cont.		*Heat pump, Ext. %, Ext. ˚C*
			ExtDmdTyp		*AI, Modbus*
	► Device settings	**► Charging circuit**	Sp.dT		*K*
			Supply pump min.		*%*
			Supply pump max.		*%*
		► Source circuit	Source pump min.		*%*
			Source pump max.		*%*
			Free cool pos src		*%*
		► El.heater	Operating mode		Value is read-only
			Src.temp limit		*˚C*

► Service menu	**► Device settings**	**► El.heater**	Switch on		*%*
			Switch hys.		*%*
			Switch on 2		*%*
			Switch hys 2		*%*
			Switch on 3		*%*
			Switch hys. 3		*%*
			Gain (Kp)		
			Ti Integr.act.t.		*s*
		► Domestic hot water	Circulation pump		*Off, On*
		► Heat circuit 1-3	► Alarm limits	Flow temp. – HihgLimit	*˚C*
				Flow temp. - LowLimit	*˚C*
				Room temp. – HighLimit	*˚C*
				Room temp. – LowLimit	*˚C*
			► Summer / Winter setting	Su/Wi mode	*Auto/Temp, Date, Summer, Winter*
				Su/Wi Time const.	*h*
				Start date	*Day of week, Date*
				End date	*Day of week, Date*
				Reset outside temp.	*Execute*
			Room temp. comp.		*Value is read-only*
			Room influence		*K*

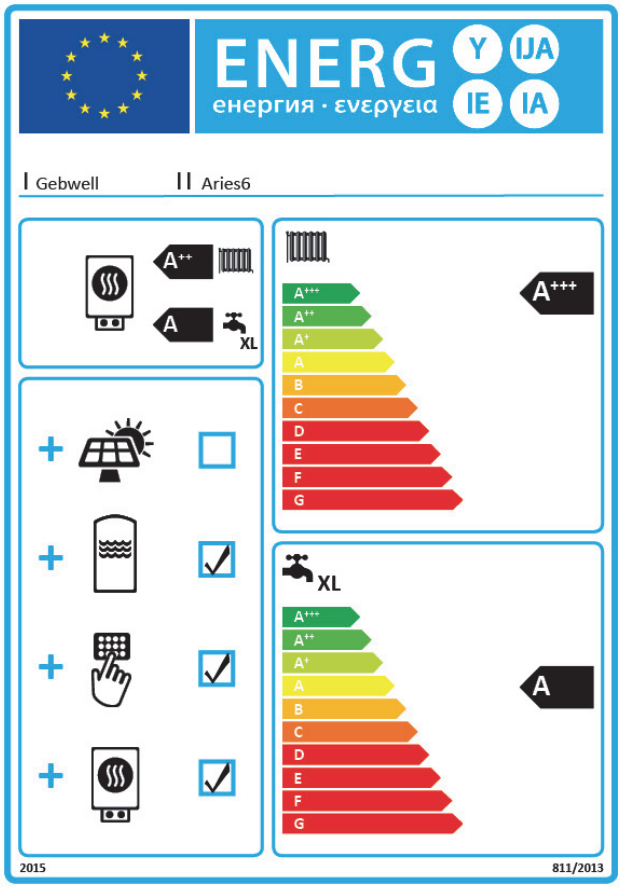
Service menu → Device settings → Additional heat

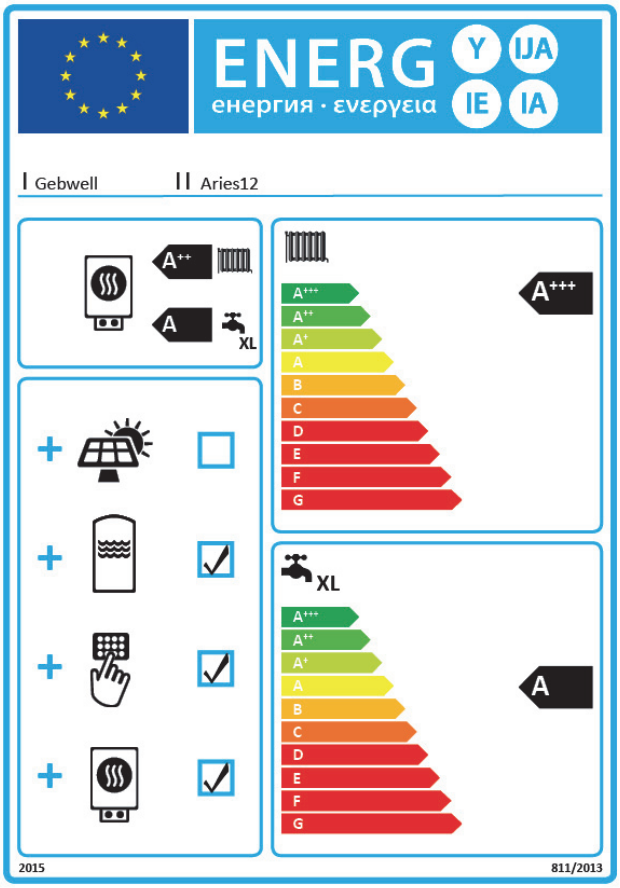
Service	**Device**	**► Additional heat**	Operating mode			*Value is read-only*
			Flow temp.			*Value is read-only*
			El.heater			*Value is read-only*
			K27 command			*Value is read-only*
			Add. heat control signal			*Value is read-only*
			► +Settings	**► Flow temp.**	High limit	*˚C*
					Low limit	*˚C*
			Control mode Heat. ele. heater			*HPErr, Parallell*
			Sequence selector			*K28-K27, K27-K28*

Service menu → Communication

► Service menu	**► Communication**	**► Modbus module 1**	State	Value is read-only
			Comm.failure	Value is read-only
			+Kanava 1:	Value is read-only
			Slave	Value is read-only
			Slave address	
			Baud rate	
			Stop bits	*1,2*
			Parity	*Parill., Pariton, Ei mitään*
		► IP-Config.	DHCP	*Active, Passive*
			IP address	
			Subnet mask	
			Default gateway	
			Preferred DNS server	
			Alternate DNS server	
► Service menu	**► Device information**	Activation key		
		Operating hours		*h*
		Internal temp.		*˚C*
		Serial number		Value is read-only

20 ENERGY LABEL





EU DECLARATION OF CONFORMITY

Object of the declaration:
Gebwell Heat pump

Product Model:
Aries

Name and address of the manufacturer:
Gebwell Oy
Patruunapolku 5
79100 Leppävirta, Finland
Tel. +358 20 1230 800
www.gebwell.fi

This declaration of conformity is issued under the sole responsibility of the manufacturer.

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

2014/68/EU	–	Pressure Equipment Directive (PED)
2014/35/EC	–	Low Voltage Directive (LVD)
2006/42/EC	–	Machinery Directive (MD)
2014/30/EC	–	Electromagnetic Compatibility Directive (EMC)
2011/65/EC	–	Restriction of Hazardous Substances Directive (RoHS)
2010/30/EU	–	Energy labelling of space heaters, combination heaters, packages of space heater, temperature control and solar device and packages of combination heater, temperature control and solar device (No 811/2013)

References to the relevant harmonised standards used or references to the other technical specifications in relation to which conformity is declared:

PED	–	EN 12735-1:2020, EN ISO 13585:2012, EN 14276-1:2020, EN 14276-2:2020
LVD	–	EN 61439-1:2021, EN 61439-2:2021
EMC	–	EN IEC 55014-1:2021, EN IEC 55014-2:2021
MD	–	EN 60 335-1:2012 A11:2014, EN 60335-2-40:2003/A13:2012/AC:2013,
Product	–	EN 378-2:2016, EN14511:1-4 :2022, SFS 6000:2022 (HD 60364, HD 60384)

PED conformity assessment procedure according to Article 4.3 (Sound Engineering Practice). Such equipment shall not bear the CE mark referred to PED, however equipment is CE marked according to applicable directives mentioned above. A risk assessment has been performed and documented according to Annex I.

Signed for and on behalf of:
Date: 26 March 2025
Place: Leppävirta, Finland

Martti Artama, CEO

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